ENGINEERING NEWS-RECORD

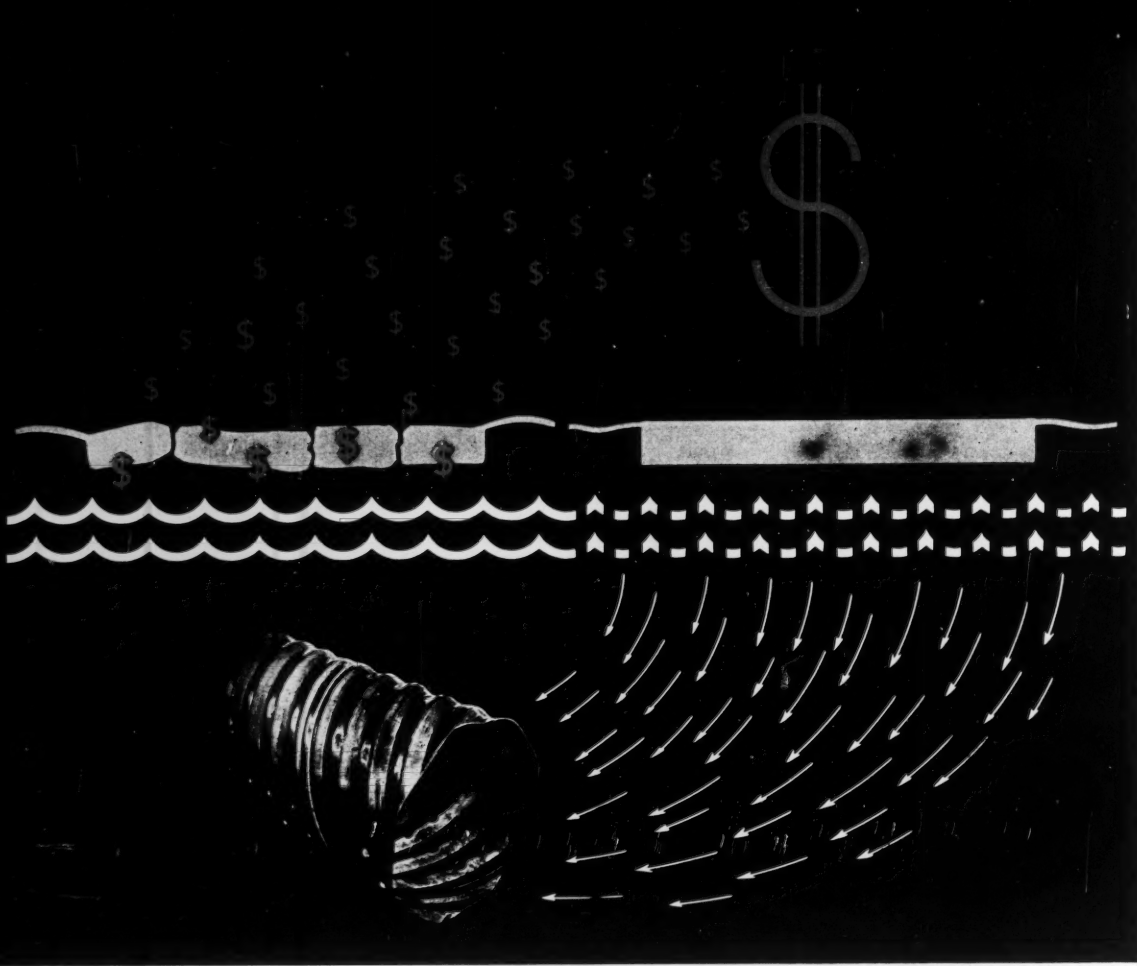
A McGRAW HILL PUBLICATION

MARCH 3, 1949

A space is cleared through the crowded lower tip of Manhattan Island for entrance to the Brooklyn-Battery Tunnel

• • •

HOSPITAL ADAPTED TO WEATHER AND EARTHQUAKE HAZARD



A lot of overhead was underfoot

Highway engineers and officials used to worry about the cost of repairing expensive pavements that broke up year after year. Cures were often only temporary even when it was known that the troublemaker was harmful groundwater lurking in the subgrade. Then ARMCO Engineers said: "The only sure cure is to drain the water out and *keep it out.*"

To do this they developed ARMCO HEL-COR Pipe and perforated it. Scientifically placed holes collect unwanted water, which is drained off along the pipe invert. Subgrades become dry and stable. Made on automatic machines, HEL-COR Pipe meets all the needs of a first-class subdrainage system. It is low in cost, easy to handle and durable. It also has ample strength to withstand shifting soils, frost action or the impact and vibration of heavy loads without crushing, cracking or disjointing.

Providing better products to meet specific needs has been standard practice at ARMCO for more than 40 years. A few examples are FLEX-BEAM Guardrail, Spiral Welded Pipe, STEELOX Buildings, PIPE-ARCH and sturdy, dependable MULTI-PLATE Bridges.

Today you can bring your drainage and construction problems to ARMCO with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve these problems.

ARMCO has a complete range of engineered products and convenient authoritative data to help you. If your problem is difficult or unusual why not talk it over with us.

ARMCO

ARMCO DRAINAGE & METAL PRODUCTS, INC.

MIDDLETOWN, OHIO • DIVISION OFFICES AND PLANTS IN THE FOLLOWING CITIES

Berkeley, California ★ Middletown, Ohio ★ South Bend, Indiana ★ Baltimore, Maryland Denver, Colo. ★ Des Moines, Iowa ★ Atlanta, Ga. ★ Topeka, Kansas ★ Houston, Texas Minneapolis, Minnesota ★ Portland, Oregon ★ Washington, D. C. ★ Guelph, Ontario

Turn on the steam—it can't burst B. F. Goodrich Burstproof hose!

Ends hazards of scalding and injury from bursting hose wall

BURSTPROOF steam hose (developed and perfected by B. F. Goodrich) is accurately named—*it is completely burstproof*. Steam or steam pressure cannot burst the hose wall; this hose can only be ruptured by a blow from outside that actually *cuts* the wire reinforcement.

Burstproof hose has no cotton fabric to burn, char, and give way. High-tensile steel wire takes the place of the fabric plies, which in other hose burn and then collapse. Here is a hose as strong and safe as steam hose can be made.

Rubber compounded to beat the heat —Heat is the enemy of steam hose. The tube in BFG Burstproof is specially compounded for safety, to resist deterioration at high temperatures. The B. F. Goodrich anti-oxidant Agerite keeps the tube live and elastic, with sufficient "flow" to allow the steel wire reinforcement to anchor itself in the rubber. A braid of strong asbestos cord (woven asbestos fabric in some sizes) imbedded just under the cover, protects it from chars and burns, protects the worker who handles it.

Armored with steel—The steel wire reinforcement is braided at the angle of greatest strength. Multiple wire strands are paralleled, to give more strength than a woven tape. Braid openings permit the wire braid to "rivet" itself to the layers of rubber, thus increasing strength and safety. Wire winding in the larger sizes is useful in resisting sharp bends or kinks.

BFG Burstproof is the safest, strongest hose in steam service. Recommended especially for saturated steam pressures up to 200 p.s.i., for superheated steam up to 388° F., and for all applications that are hard on steam hose. See it at your local distributor or write: *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

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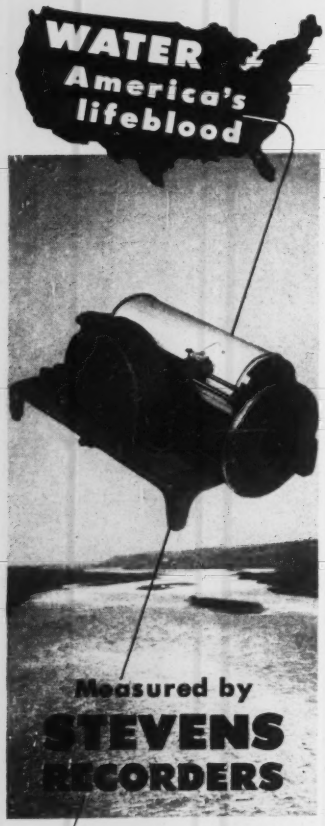
RUBBER FOR INDUSTRY



GRAPHIC RECORDS are the prime requisite in the control and utilization of water. Stevens Type F Water Level Recorders are providing these graphic records daily in irrigation, water supply, hydraulic experiments and sewage waste studies.

The Type F Water Level Recorder has been developed to provide automatic records of liquid levels at a minimum of cost.

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ENGINEERING NEWS-RECORD

VOLUME 142 MARCH 3, 1949 NO. 9

WALDO G. BOWMAN
Editor

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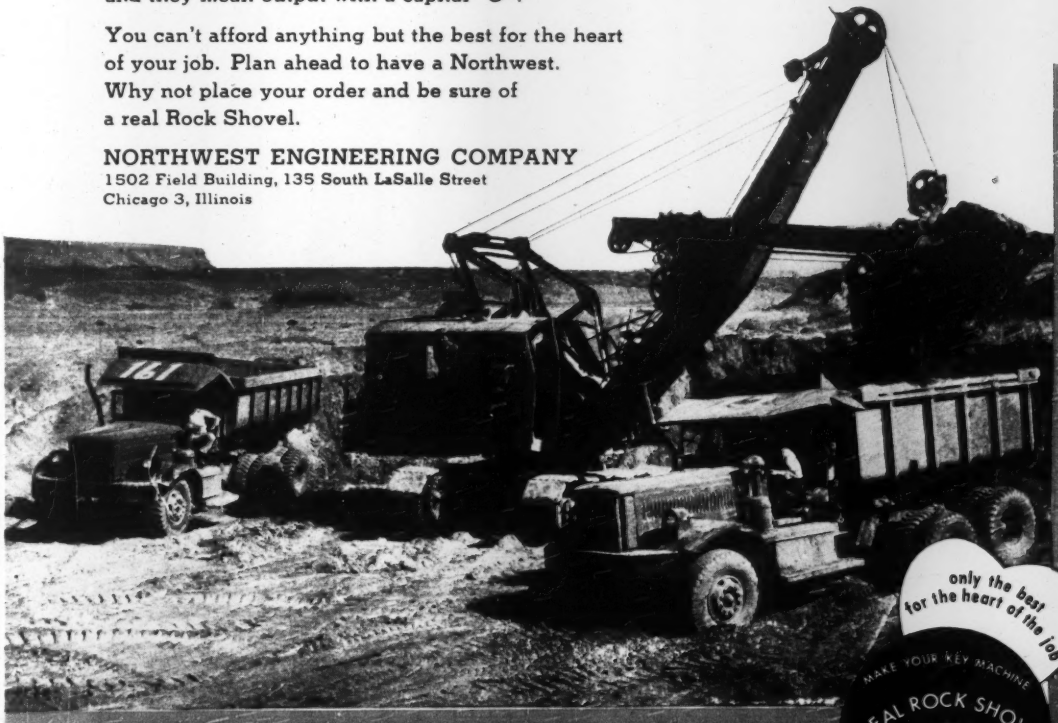

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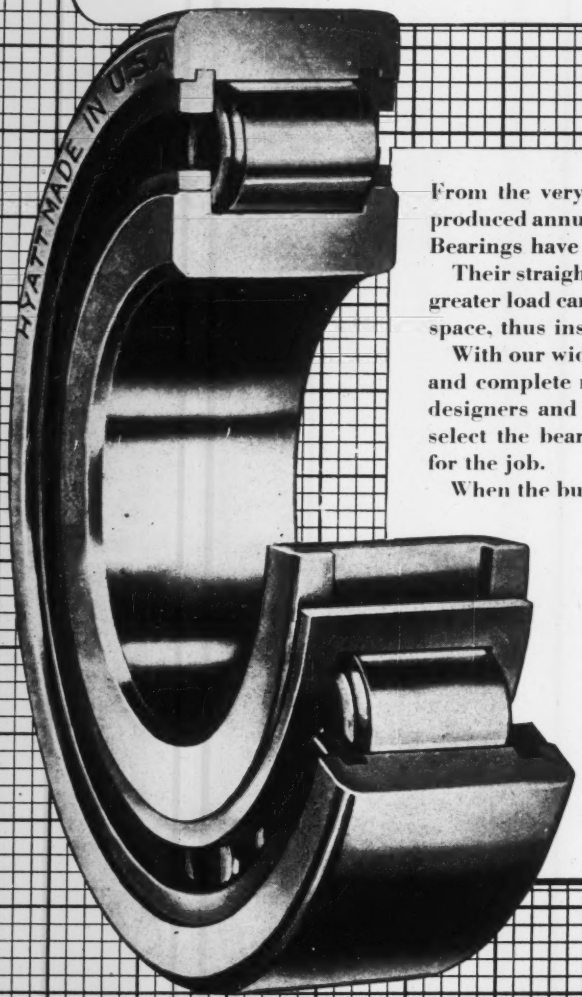

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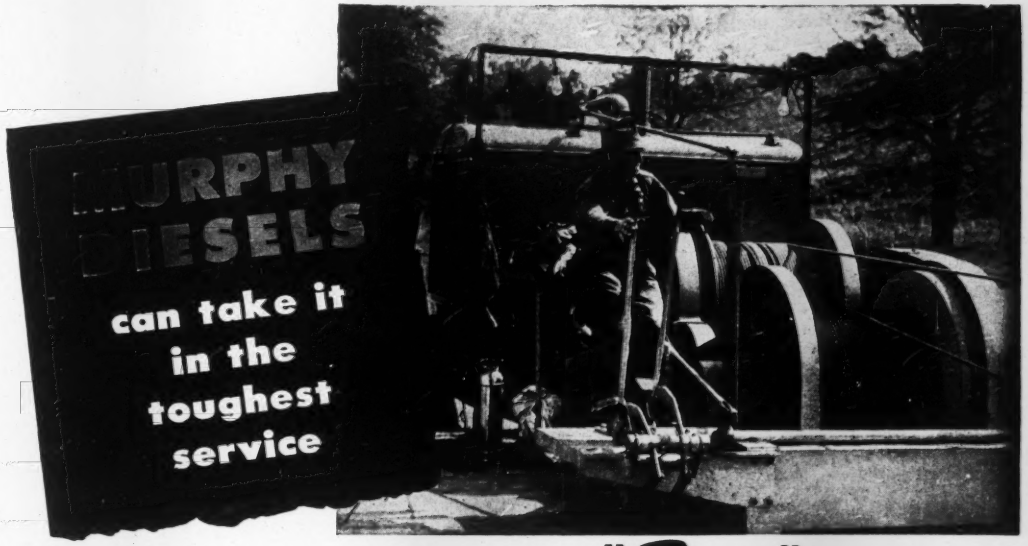
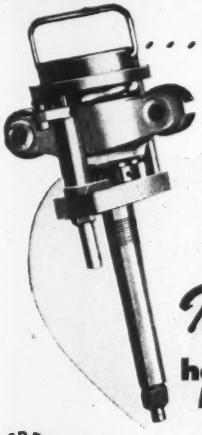


...because they are "True" diesels!



the Unit Injector

heart of the MURPHY DIESEL

The "true" diesel operating principle of Murphy Diesels—solid fuel injected directly into a plain open combustion chamber—makes them capable of taking the beating of the toughest day-in-day-out heavy duty service. The absence of pre-combustion or pre-mixing chambers reduces turbulence and conserves the heat of compression for instantaneous ignition. Wear is reduced . . . lubricating oil holds up longer . . . valves rarely, if ever, have to be ground. Unit fuel injection eliminates common injection troubles.

Get full details from your Murphy Diesel Dealer, today. Ask for a copy of the booklet "7 Questions to Ask a Diesel Engine Salesman" or write direct.

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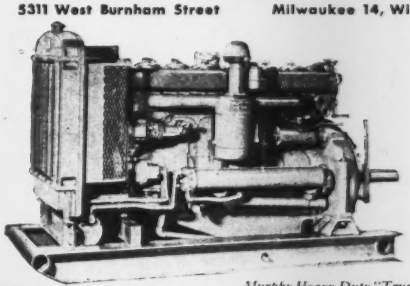
BETTER ROADS FOR A BETTER WORLD — 45th Annual Convention and Road Show, SOLDIER FIELD CHICAGO, JULY 18-24, 1948

A simple, compact unit injector for each cylinder eliminates all high pressure fuel lines and puts an end to air binding, surging and erratic injection.

Above right—150 H.P. continuous, 180 H.P. intermittent, MURPHY DIESEL powers this slackline cableway scraper.



Murphy Heavy Duty "True" Diesel Engines and Power Units, 90 to 190 H.P. Generator Sets, 60 to 115 K.W., A.C. or D.C.

MURPHY DIESEL — LOWEST ULTIMATE POWER COST

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METROPOLITAN OPERA
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Saturday afternoon.

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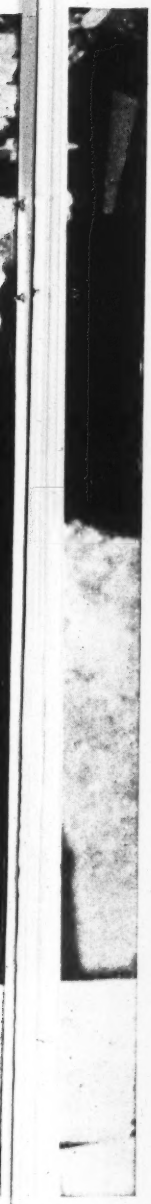


WHY HAVE RUST IN DRILLS?

Drills lubricated with Texaco Rock Drill Lubricants EP are fully protected

RUST is a constant threat to drill operating efficiency — and a common cause of high maintenance cost. *Texaco Rock Drill Lubricants EP* protect against these dangers whether your drills are running or idle.

But rust prevention is only one job. *Texaco Rock Drill Lubricants EP* do many others. Their high film strength and adhesiveness protect moving parts against wear. They lubricate effectively even under extremely wet conditions. They resist oxidation and flow readily at all operating temperatures.

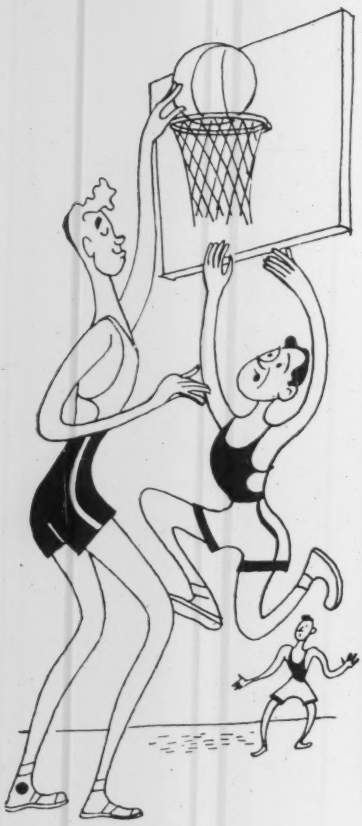
Texaco Rock Drill Lubricants EP meet the exacting specifications of leading rock drill manufacturers and the Compressed Air and Gas Institute.

Let a Texaco Lubrication Engineer show you how effective lubrication can assure you longer drill life, faster drilling and lower maintenance costs. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

For greater compressor efficiency, keep valves clean, rings free, air lines clear by lubricating with *Texaco Cetus, Alcaid or Algol Oils.* For heavy-duty service and wet conditions, use *Texaco Regal Oils (R & O).* Your Texaco Lubrication Engineer will recommend the ones best suited to your requirements. Keep your hydraulically-operated construction equipment working more efficienty—systems free of rust and sludge—by using *Texaco Regal Oils (R & O)* as the hydraulic mediums.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



IT'S EASY WHEN YOU'VE GOT THE REACH!

A BAY CITY Model 180 CraneMobile made a tough assignment easy when Terry Steel Contractors, Inc., had to lift tons of structural steel high into the air when Bloomingdale's added another story to their building. A narrow street, a 40-ft. radius and typically busy New York traffic were added problems that the CraneMobile took in stride. A 100-foot boom with a 30-foot jib made the lift with space to spare while the CraneMobile handled the reinforcing steel with ease. For full particulars on the power, mobility and maneuverability of this 20-ton capacity CraneMobile, see your BAY CITY dealer or write direct.

BAY CITY

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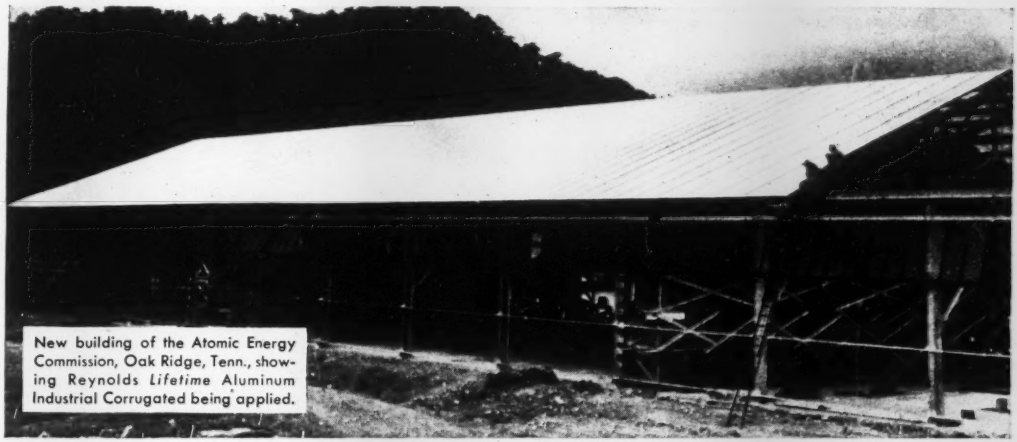
BAY CITY SHOVELS INC., BAY CITY, MICHIGAN See your nearest Bay City dealer for excavating and material handling equipment in sizes from ⅜ to 1¼ yard with crane rating up to 20 tons. Both crawler and pneumatic tire mountings.

OAK RIDGE PLANT USES REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED



New building of the Atomic Energy Commission, Oak Ridge, Tenn., showing Reynolds *Lifetime* Aluminum Industrial Corrugated being applied.

Tomorrow's Planners Build with the Light, Strong, Rustproof, Heat-Reflective Material that practically eliminates Maintenance

Where industrial buildings are most carefully planned, as at Oak Ridge, entire designs are predicated upon aluminum's lighter structural load combined with the great strength of this .032" sheet formed in extra deep corrugations. Important framing economies can be effected in new structures. And the elimination of painting and reduction of sun load are equally important in re-roofing and re-siding.

Application is simple, with any type of purlin. Reynolds supplies all necessary accessories for complete installations.

If you have a special construction or building repair problem, call on our engineers.

Reynolds Metals Company,
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offices in 32 principal cities.

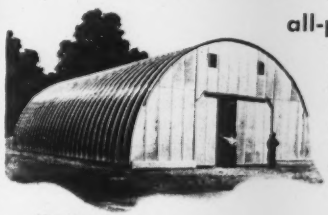
IF YOU SEE RUST YOU KNOW IT'S NOT ALUMINUM

REYNOLDS METALS

REYNOLDS *Lifetime* ALUMINUM BUILDING PRODUCTS

World's Largest Producer of Aluminum Building Products

REYNOLDS "ALUMI-DROME"
all-purpose prefab!



All-aluminum. Patented all-bolt construction. Basic unit 36' x 60', length variable by 6' sections. Wide choice of door and window arrangements.

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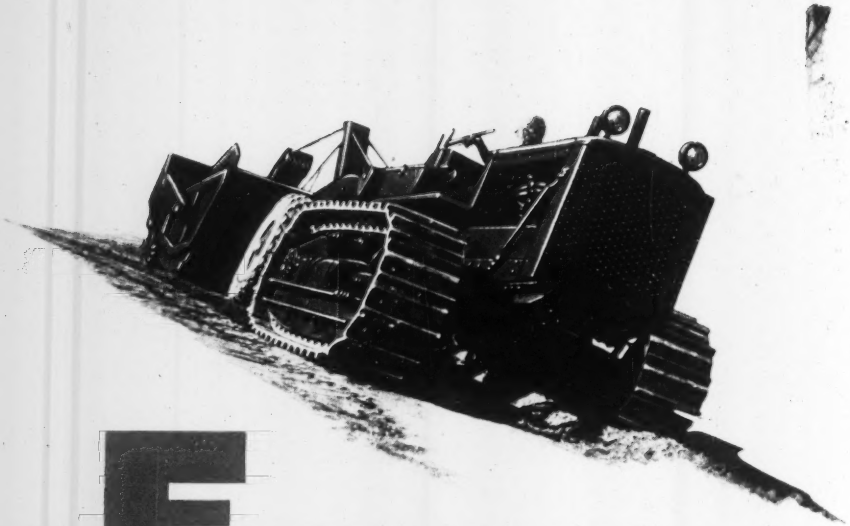
Address _____

Your Name & Title _____



THE ENGINE THAT MOVES THE EARTH

When you buy earthmoving power, you buy the tools of the construction trade —crawler or wheel tractors, motor graders, draglines and shovels. The one common denominator of all is the engine. It gives get up and go to the equipment. It is the power that moves the earth.

When you buy and use earthmoving equipment, you buy and use the power of engines to work for you!

When you specify INTERNATIONAL Power, you can be sure of getting your full money's worth of power and performance. Diesel—or gasoline—International Engines are designed to give you dependable and efficient power. And they're built to the most exacting standards of the industry.

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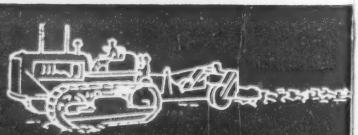

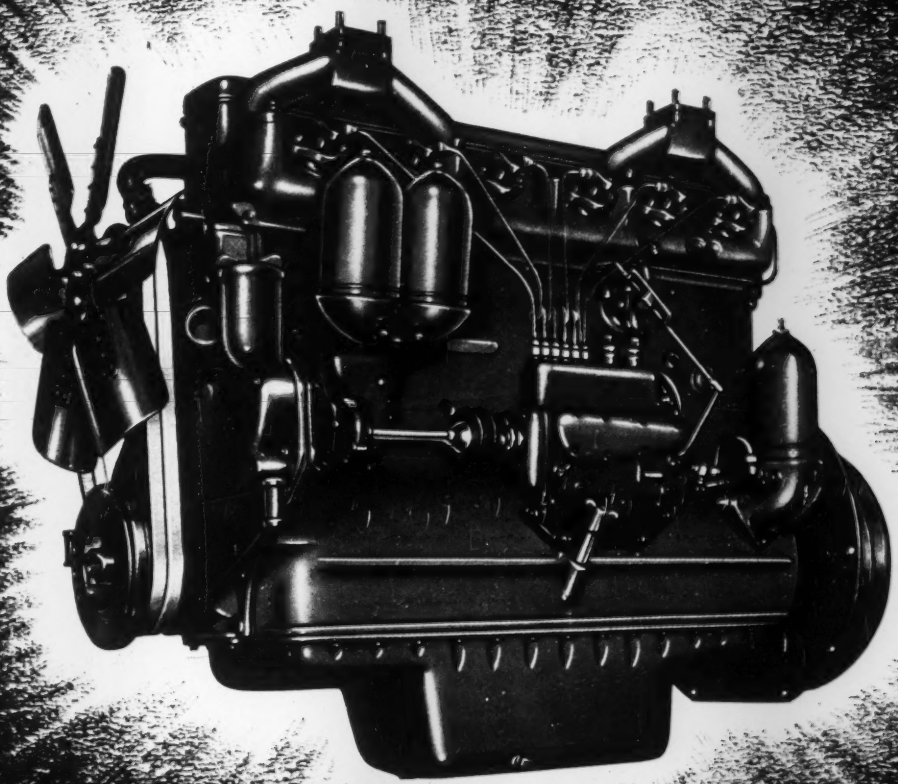

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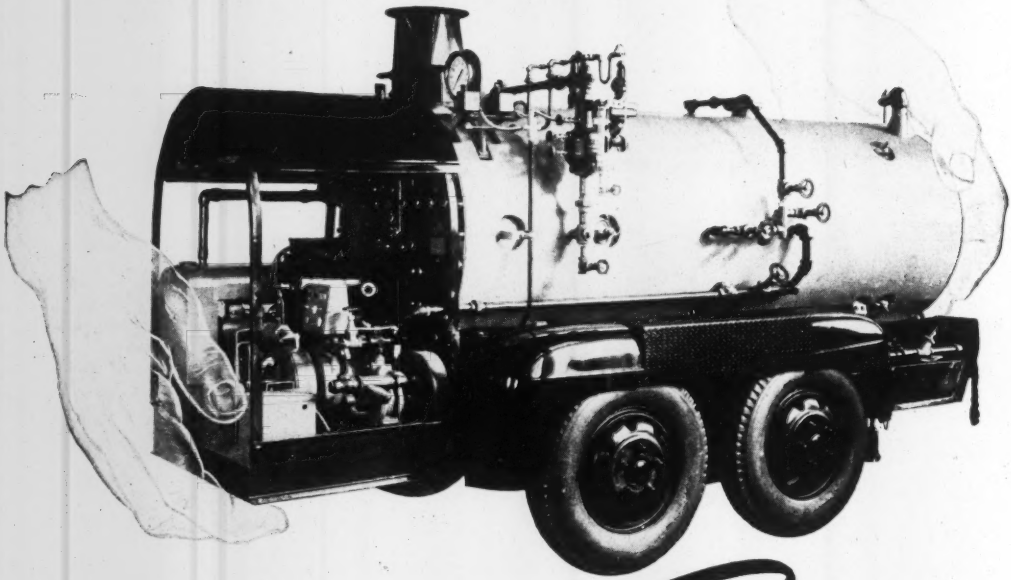

PUT IT WHERE YOU NEED *Steam*

★ READY MIX CONCRETE PLANTS ★ BITUMINOUS MIXING PLANTS
★ PILE-DRIVING ★ ASPHALT STORAGE TANKS ★ TANK CAR HEATING
★ AGGREGATE HEATING ★ WINTER CONCRETE OPERATIONS

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Available in 80 HP and 125 HP—150 PSI. (For permanent installation a capacity range of 15 to 500 HP is available in other Cleaver-Brooks packaged steam generators.)

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80 H.P. — 125 H.P. — 150 P.S.I.

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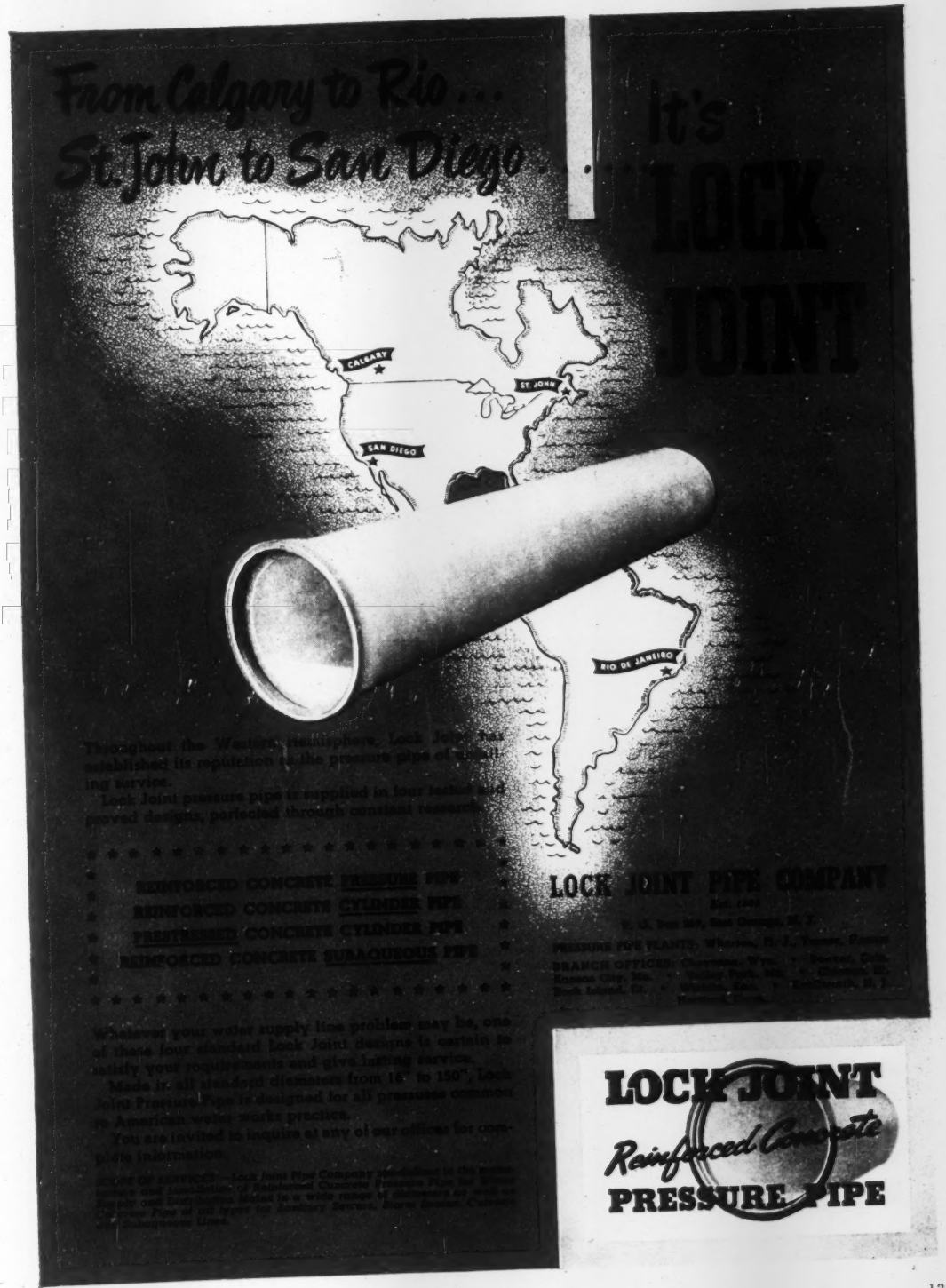
- Choice of Gas or Electric Motor

Send today for illustrated catalog on the Cleaver-Brooks Model LFM Steam Generators.

Built by the Pioneers and Originators of Packaged Steam Generators — Tank Car Heaters — Bituminous Boosters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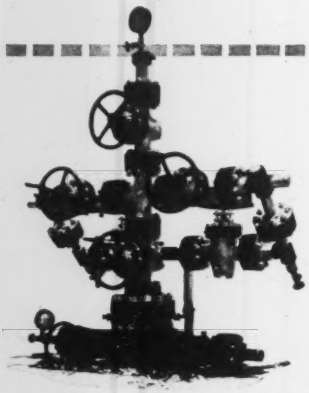
FROM WELL HEAD to FINISHED PRODUCTS



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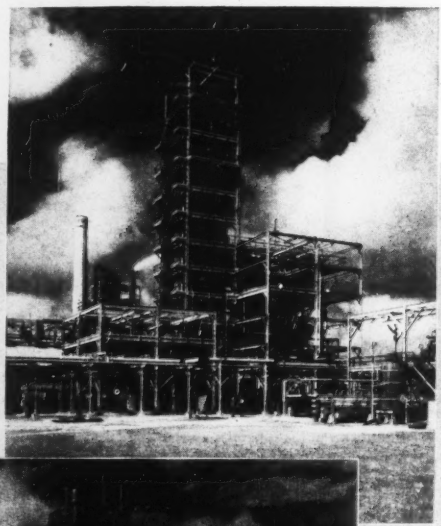
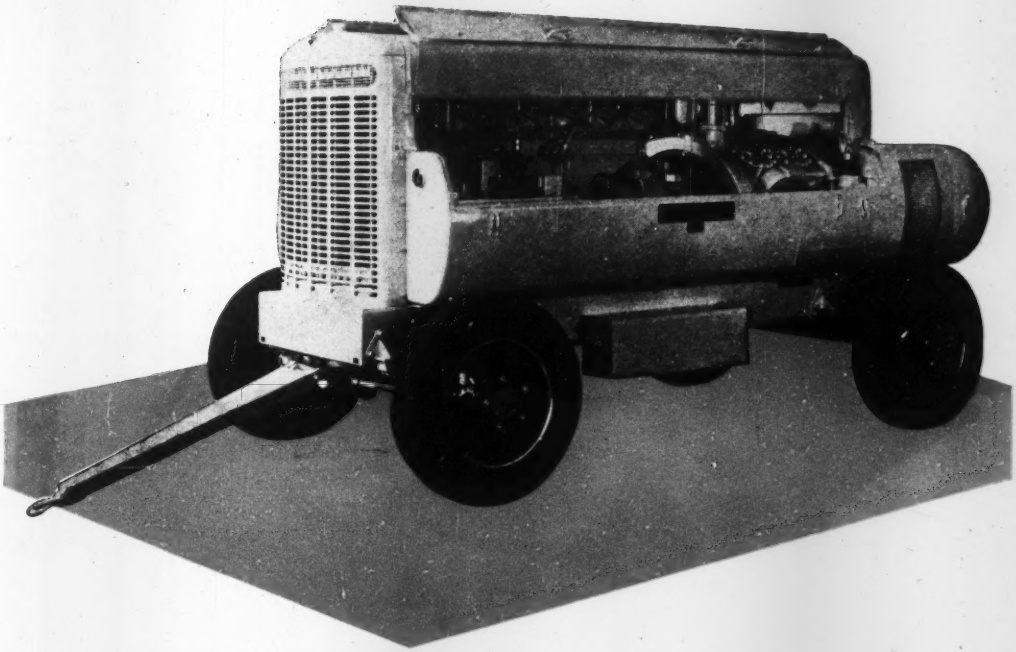


STONE & WEBSTER ENGINEERING CORPORATION

A SUBSIDIARY OF STONE & WEBSTER, INC.



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delivers the air—dependably—with low up-keep
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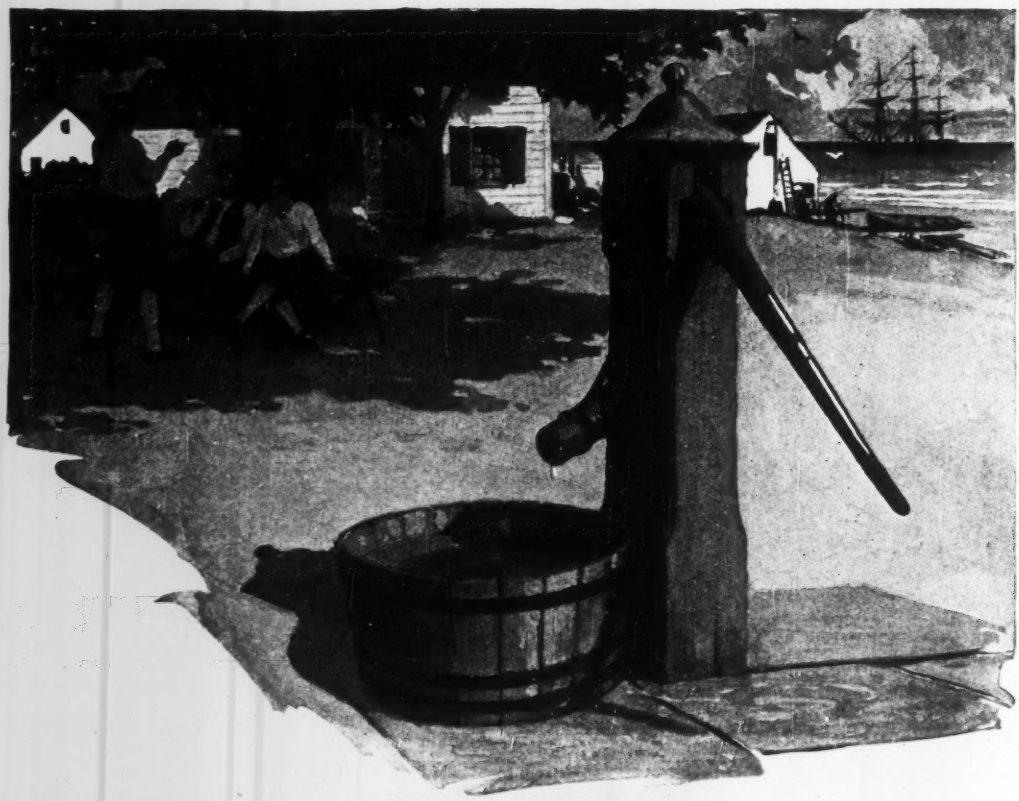

Pumps *by* SMITH
for Today's Needs

ROLL back the years to the "Town Pump" which served the people's simple needs.

In its place are Smith Axial Flow Pumps, with either fixed or adjustable vane impellers, serving today's populations, almost everywhere!

Write for Bulletin No. 148.

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How to put the "Personal Touch" into a coast-to-coast business

KEY engineering and construction men can at last give adequate personal attention to widespread activities when a company-owned Beechcraft Executive Transport is on the job with them. This 200-mph seven-to-nine place transport reduces travel time by 75%, and with it *more* jobs can be supervised by the *same* number of men. Whether used on selling trips, as a job expediter or for customer convenience, this luxuriously comfortable plane is a *paying* investment for your business.

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We have also acquired a 4-place Bonanza which we use to commute between New York and Hartford. This one-hundred-mile distance equals just forty minutes' flying time - and we make our own schedules. Our Beechcrafts more than pay their way.

Sincerely yours,

Clifford S. Strike
PRESIDENT
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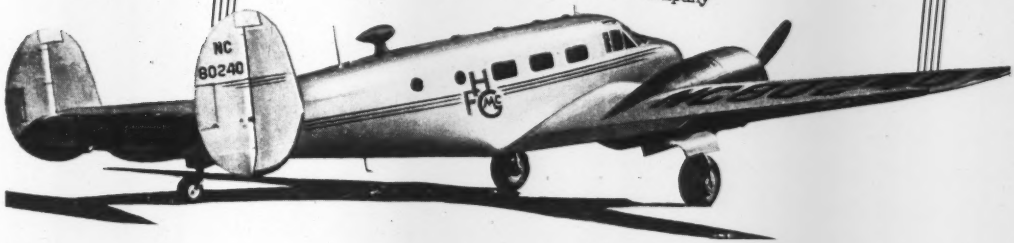

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From Six BUCYRUS ERIE 4-Wheel Scrapers

Investigate the new line of Bucyrus-Erie 4-wheel scrapers . . . six models to match the horsepower of International crawler tractors . . . six scrapers that combine big pay loads with fast cycles to produce low cost dirt . . . two types: B-type with front lift and S-type with rear lift. Ask your International Industrial Tractor distributor about the many features of these new scrapers. Select the size you need, put the scraper on your job — then watch the cuts go down fast! Bucyrus-Erie Company, South Milwaukee, Wisconsin.

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FAST FULL LOADING . . . . . Exclusive double-curve blade produces full loads quickly, distributes load evenly, lowers horsepower requirements for loading, breaks up chunks and reduces voids, loads more pounds of dirt per cubic yard.

FAST SMOOTH HAULING . . . . . Scraper is pulled at drawbar level. Big low pressure tires, same size all around, stay on top even when going is soft. Rolling resistance is low because wheels are mounted on anti-friction bearings and flotation is equalized.

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FAST CLEAN DUMPING . . . . . Exclusive two-section apron can be adjusted to provide opening that suits material being loaded. Positive rolling ejection gets rid of load fast. Exclusive torque-rod speeds return of bowl to loading position.

B-250
22 cubic yards (struck)

B-170
15 cubic yards (struck)

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S-113
10 cubic yards (struck)

S-91
8 cubic yards (struck)

S-68
6 cubic yards (struck)

S-46
4 cubic yards (struck)

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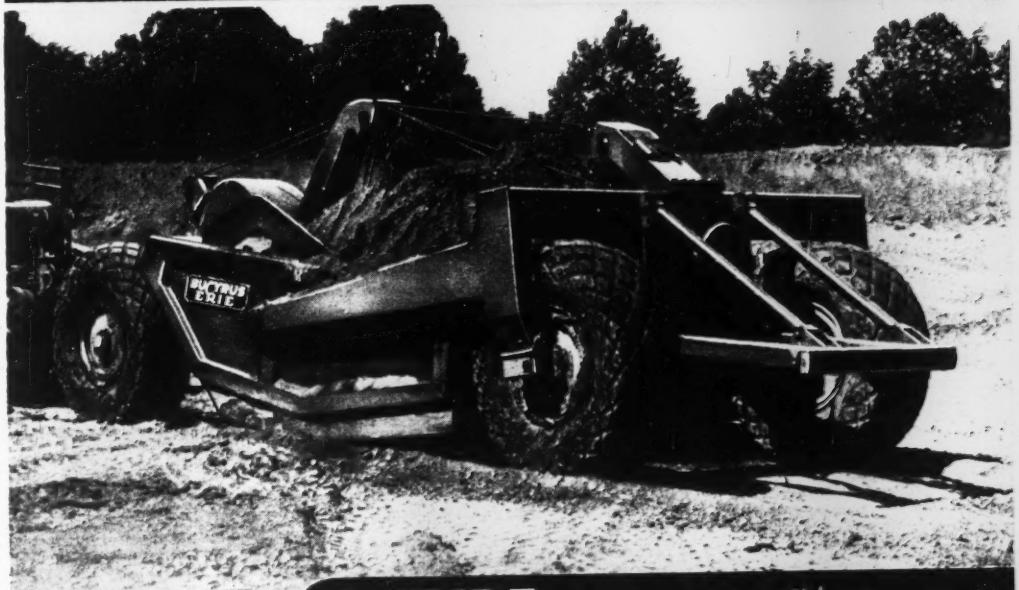
See Your INTERNATIONAL

for Low Cost Dirt

B-TYPE 15 and 22 Cubic Yard



S-TYPE 4 to 10 Cubic Yard

Industrial Tractor Distributor

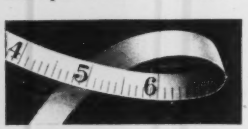
BUY STEEL TAPES WITH EASY TO READ MARKINGS THAT ARE DURABLE

Jungle dampness . . . immersion in sea water . . . chemical fumes—these and many more rugged war time tests have proven Lufkin Chrome Clad to be an outstanding development in measuring tapes.

The illustrations below show why they are the first steel tapes with both durable and easy to read markings, features every tape user will welcome. The hardened steel base is of remarkable toughness and flexibility.

Over this goes a rust resistant coating—next, multiple coats of electro-plating—and then a heavy chrome plating with a non-glare satin finish. Against this light-absorbing surface the jet black markings stand out sharply, easy to read in bright or poor light.

And notice how the markings are bonded to the steel base—sunk below the chrome surface to protect them even against concrete or gravel wear. If you want a tape with durable, easy to read markings—a tape that will not crack, peel or chip, a tape for tough usage—ask your dealer for Lufkin Chrome Clad.

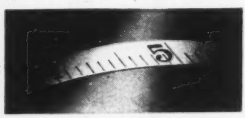


KINKS RARELY BREAK THEM

A tough flexible "kink-resistant" steel protects against line breakage, and saves time as well as repair expense.

DIAGRAMMATIC CROSS-SECTION VIEW

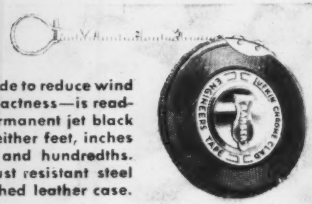
1. Hardened Steel Tape. 2. Rust Resistant Coating. 3. Multiple Coats of Electroplating. 4. Hard, Smooth, Non-Glare Chrome-Plating. 5. Black Markings Bonded to Steel, Sunk Below Surface.



EASY TO READ IN ANY LIGHT

Durable, easy to read markings stand out sharply against the non-glare, chrome surface, even after years of tough usage.

"RANGER" Model . . . Lufkin's Chrome Clad tape specially designed for engineers. The sturdy steel line—only ¼" wide to reduce wind resistance and provide compactness—is readily detachable from case. Permanent jet black markings are available in either feet, inches and eighths or feet, tenths and hundredths. Zero falls at end of line. Rust resistant steel liner protected by hand stitched leather case.



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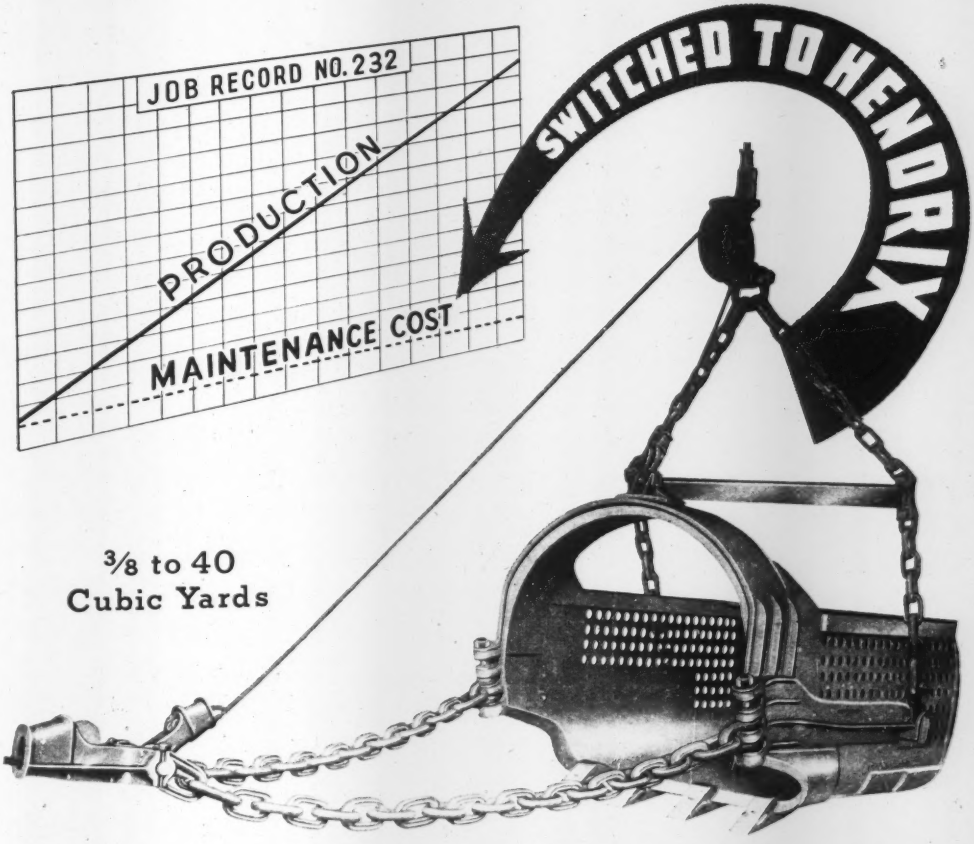

THAT'S HOW YOU CAN MAKE MORE PROFIT!

Many dragline operators who have "switched" to Hendrix Dragline Buckets are reporting bigger profits on each job. Some are quite frankly amazed when job reports are turned in to find that with a Hendrix there has been no delay due to break-downs . . . no maintenance cost for the bucket!

The HENDRIX, although lighter in weight than similar buckets, possesses sufficient stamina, ruggedness and wear-resisting qualities to give long-lasting service to the dragline operator. Cast manganese steel runners and wearing shoes on the TS and renewable manganese steel shoes for runners and wearing plates on the HS result in increased production through less loss of time while on the job.

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

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TOP SPEED ON WORLD'S GREATEST HOUSING JOB

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WITH 34,000 families already living in 31 apartment projects . . . with 21,000 apartments now under construction . . . and with 11 projects now in the planning stage, the New York City Housing Authority is setting the pace in a $750,000,000 city-wide home-building program. Sound planning and efficient administration have wrought something approaching a miracle under our very eyes, converting slum areas into healthful, modern housing and raising the standards of life and living throughout the City.

This greatest housing program of all time goes ahead at top speed, winter and summer. To maintain schedules through the cold-weather months, the Contractor on South Beach Houses, Staten Island, switched to 'Incor' 24-Hour Cement for superstructure concrete. Results: (1) Forms stripped 3 days sooner . . . faster form re-use, fewer forms needed for high-speed concreting; (2) 60% saving on heat-protection expense . . . a big economy factor with coke at about $25. a ton!

Any season, any type of job, dependable 'Incor'* high early strength assures maximum job speed at minimum cost. *Reg. U. S. Pat. Off.

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 27,000,000 BARRELS ANNUAL CAPACITY

CONSTRUCTION TRENDS

Business in general this winter has taken some of the sharpest bumps it has felt in 10 years.

But heavy construction, by reports coming to ENGINEERING NEWS-RECORD, is in the middle of a boom. The first eight weeks of 1949 have seen construction awards jump 53 percent above the level of a year ago.

What does the lag in general business—as contrasted to the unexpected boom in ENR contract awards—mean for construction as a whole?

Unemployment is again in the headlines. Buyers' markets have overtaken practically all lines, including a substantial section of the automobile business. Prices on a broad front have tumbled since November.

This, however, doesn't yet suggest that the postwar recession long-expected by many is developing.

General business currently is feeling the impact of two economic forces that will reverse themselves in the weeks to come.

First is the usual winter let-down in outdoor work, such as home-building and farming, and in retail and wholesale trade, which falls off after Christmas. Most of the January upswing in unemployment was probably seasonal in this way.

Second is the weight of federal tax collections at this time. The government collects almost half of the whole year's income taxes from individuals and corporations between December 15 and March 15. This means that in the first quarter it takes in about $5 billion more than it pays out. Draining that much money out of business channels slows down activity. In 1947 and 1948 it was reflected in dips in bank deposits, retail sales, and production indexes.

But both these forces go into reverse soon.

Outdoor work, in fact, usually begins to pick up from its winter lull by March. By April, too, not only do tax collections fall off, but the Treasury will be mailing tax refunds in volume. They will be heavier than usual this year because people overpaid taxes in early 1948 before the tax cut went into effect. Moreover, government expenditures generally are expected to rise sharply this year—giving business a lift.

Complicating the winter dip has been the fact that many lines—such as textiles—were making a sharp adjustment to buyer's markets.

Construction, meanwhile, has seen diverse trends. Apparently housing, and production of housing materials, has fallen off more than was expected. Light construction work—which is not included in ENR reports—apparently is running well below a year ago. But heavy construction, as reflected in ENR reports, is booming.

ENR's summary figures show that sewerage and bridge projects are running 54 percent and 74 percent, respectively, above a year ago. Public buildings are up 107 percent, industrial, including utility 65 percent, and commercial 76 percent. Only classifications that are substantially under a year ago are waterworks, 26 percent below, and highways, which are down 22 percent.

Public works as a whole are 35 percent ahead of 1948 and private work 71 percent.

Reports from the field indicate that many long-delayed projects are now being put under contract, and, that possibly, some projects are being rushed in order to secure materials now, before the season gets well underway.

As yet, what's happened to general prices and employment as a whole can't be called alarming. Nor does it suggest that a real business setback is developing. But it does emphasize the fact that business in 1949 will not be like it was in 1947 or 1948. Instead, it will be more like a good year in the middle 1920's. Activity promises to be high and the country prosperous, but some lines will have bumpy going at times.

The shaking-out, too, probably means that the steady rise in prices is over. Contractors will have a much better chance to hold costs level this year, or even to pare them down, than they've had since the war began.

Lumber, with even plywood feeling the turn, has seen prices drop steadily. It may go even lower before the building season gets into full swing.

Later this year steel—at least in construction types—may be somewhat easier to get than in 1948. Pressure of demand on the mills for many types of steel, has definitely eased. The industry seems sure to run at capacity through the first half of the year. But no one is saying whether the tightness will hold through the second half.

For construction this seems to add up to this conclusion:

Business in general still promises to run on at a high level well into 1949. This should give housing and other light construction projects new impetus.

Heavy construction projects, which seem to be getting off to a flying start, may well set new records.

Easing in supplies, of lumber and other materials, promises to allow contractors to get in even more work this year than they had expected. But materials will probably still set a ceiling on 1949 volume.

How to Keep the Job Moving

In the maintenance of building schedules no single factor is more important than prompt steel service. That's why Ryerson handles every call for construction steel as an emergency call.

Our prompt, personal attention to every order, no matter how large or small, cuts costs, conserves man-hours, helps keep building projects moving smoothly to completion.

Whatever your requirements, it will pay to check nearby Ryerson stocks. Because of the current demand for steel, all products are not always available. But our over-all stocks are probably still the nation's largest and when a particular product is not on hand our qualified specialists will gladly assist in the search for a practical alternate.

So for steel service made to match the swift pace of *your* operations, call, wire or write the nearest Ryerson plant.

PRINCIPAL PRODUCTS

BARS—carbon & alloy, hot rolled & cold finished
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RYERSON STEEL

THE CONSTRUCTION WEEK

TOUGH NUT—One of the most difficult tasks of Hoover's Commission on Organization of the Executive Branch of the Government is to frame a recommendation for combining or regrouping federal engineering and construction functions. It is currently wrestling with the problem—and the answer will be contained in what will be the last of 13 different reports it plans to submit to Congress. The deadline date is less than a month away. One dilemma is to reconcile the proposals of two task forces—one favoring a Natural Resources Department, the other a larger, more inclusive Works Department. Both plans pose another dilemma—what to do with the civil works functions of the Corps of Engineers. Influential congressional opposition to any change in the corps' responsibilities makes this a tough nut for the Hoover group to crack.

MONEY FOR FLOODS—With a wary eye on the abnormal snow-cover in the midwest and mountain states, Army engineers last week gave a group of senators an informal estimate of $25,000,000 as a needed independent fund to cope with possible floods this spring. Of the total, $8,000,000 might be needed along the Mississippi, they thought. Nobody would positively predict floods, however—too much depends on ground conditions, slow or rapid thaws, and rain.

BASE OR POSSESSION?—The U. S. Justice, State, Army, Navy and Labor departments have asked the Supreme Court to reconsider a Dec. 6 decision that the military base in Bermuda is a possession—and that therefore employees on government construction there are subject to wage-hour law and overtime provisions. Army Secretary Royall told the court increased labor costs will apply immediately to bases in the Philippines, Canada, Okinowa, Greece, etc., and may cost the government "hundreds of millions" of dollars. Another factor is the possibility of lawsuits by employees at "secret" bases that may reveal the extent and purpose of such installations, Royall added.

ATOMIC LABOR CODE—A labor code for application at the nation's big fission plants will be ready when wage negotiations at Oak Ridge come to a head this June. A study commission set up after the strike-threat of last summer is now writing reports both for the President and the AEC. The code is expected to include: (1) A no-strike-no-lockout policy for contractors and unions; (2) an impartial board to settle issues not settled by collective bargaining; (3) a set of standards to guide the board in determining wages and working conditions.

MONTREAL UNDERGROUND?—Citizens of Montreal, Canada's biggest city, may be going to work like New Yorkers in the future. Provincial officials revealed that Premier Duplessis has received reports from "two prominent U. S. engineers" calling for a $150 million subway system, to be built in four years and operate at an average of 8⅓ cents a ride.

HOUSING COSTS DOWN—Herman T. Stichman, New York's state housing commissioner, happily noted a downward trend in bidding for public housing projects last week. Example: In Schenectady, where bids last September set costs at about $10,888 per apartment, re-design brought new bids of $7,143. The occurrence was the third in recent months where prices tumbled, Stichman said. Other cases were at Utica, Fulton and White Plains.

POWER, WATER TALKS—The British Columbia government and some U. S. officials have reached the talking stage on a plan for developing water storage in the Arrow Lakes-Columbia Basin area. Some of the talk is that the U. S. would buy up 5,000,000 acre-ft. of water each winter from the Canadian province, with British Columbia getting payment either in cash or in power from U. S. installations. One proposal would involve a 50-ft. high, 1,000-ft. long earth and rockfill dam at Arrow Lake. Another plan calls for raising the lake to the level of the famous 1894 flood, which would require a 25-ft. dam impounding 3,000,000 acre-ft. The accepted plan would be financed by the provincial government, since it would be entirely within Canada.

TAMPA BRIDGE AGAIN—News that the Reconstruction Finance Corporation has asked a financial and traffic study of the proposal have brightened hopes for a new vehicular bridge across Tampa Bay. The St. Petersburg Port Authority said RFC studies have shown a higher traffic and earning potential than did original studies. High construction costs have thus far held up the design and construction of the crossing: the state legislature set a $15,000,000 debt limit, although the authority wants this raised to $25,000,000.

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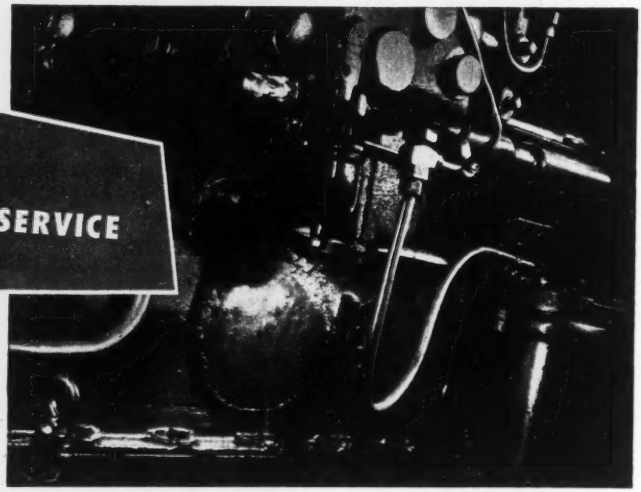
7500 HOURS MORE SERVICE

...from truck engines repaired with NI-ROD



IN THE open-pit nickel mines at Copper Cliff, Ontario, Diesel trucks haul 32-ton ore loads up steep, winding roadways.

After several thousand hours of this severe service, failures develop in engine parts, failures such as the cracking of cast iron cylinder blocks. New engine blocks cost $644.09 each . . . a price that makes the prospect of repairs very attractive.

In the past, damaged blocks have been repaired by oxy-acetylene welding. But recently, repairs have been made with metal-arc welds, using Ni-Rod* electrodes. This technique has been completely successful, resulting in excellent weld quality and reduced welding time.

Here are three typical case reports on repairs made with Ni-Rod:

"1. Block broke in crank chamber after 9381 hours of service. A patch was welded in with Ni-Rod. Since the repair, the block has operated 2064 hours and is still in good condition. Cost of welding was $12.75.

"2. Crank shaft failed after 1746 hours. The broken end engaged the main bearing shells, turning them in the block, heavily scoring the saddle. Repairs were made by machining the bearing area to .100-inch oversize, building up with Ni-Rod, and finally machining to correct size. This prolonged the engine life by 4087 hours. Cost of the entire repair was $40.60.

"3. Crank shaft failed after 4540 hours, causing damage similar to that described in Case 2, above, and was repaired the same way. The engine is still in operation 1369 hours after the repair. The cost of repair was $42.50."

The three blocks described have a total replacement value of $1,932.27. Subtracting the repair costs, there is a net saving of $1,836.42, and a gain of more than 7520 hours of operating service.

If you are not yet familiar with Ni-Rod's outstanding advantages, why not order a package today? Your nearest INCO distributor stocks Ni-Rod in 3/32", 1/8", 5/32", and 3/16" diameters.

Send for your free copy of: "NI-ROD—A New Electrode for Any Cast Iron Welding."

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- Stable arc in all positions
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- General repair cast iron parts, including build-up of worn surfaces
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Good Omen on the Ohio

First test of public support for stream-pollution abatement in the Ohio River valley under a compact agreement—measured in terms of willingness to spend the money necessary to do a proper job—is more than reassuring. As detailed elsewhere in this issue, the recently organized Ohio Valley Water Sanitation Commission, which functions as the agency of eight states, has taken its mandate on face value and outlined in frank terms what was required in the Cincinnati area to improve conditions in that section of the river. The recommendations were stiff, calling for a higher degree of treatment of wastes than municipalities and industry had previously believed to be necessary. Yet at the public hearing called for the purpose of giving interested parties an opportunity to take issue with the commission's findings, there was unanimous approval even though the higher degree of treatment will cost municipalities and industry more money.

For example, the city of Cincinnati suited action to words in telling the commission that it would revise plans for treatment plant facilities on which bids for construction will be taken in July. And the Northern Kentucky Sanitary District, which embraces a number of communities likewise reported that its plans for sewage disposal works now under design would be drafted in accordance with commission findings. Thus, the courageous attitude of the commission in establishing standards based solely on factual engineering studies is matched by the intelligence of the people it is attempting to serve. This is an auspicious omen for the success of the biggest interstate river-cleanup job ever attempted.

More Use for Local Soils

It is interesting to see the swings in thinking about construction materials as engineers gain more knowledge about their characteristics. Take soils as an example. As the movement toward a scientific approach to the use of that oldest construction material began to gather momentum, elaborate methods for testing soils were developed and systems for classifying and identifying them for structural uses were produced. Specialists in the new field of soil mechanics conversed with each other in terms of liquid limits, plasticity indexes, triaxial shear strength, Proctor density and California bearing ratios. When soils were being specified for embankments or for highway or runway bases, specifications were prepared on the basis of this new knowledge, and any soil that did not meet these specifications was summarily rejected.

But fuller knowledge has come with experience, as should be true of any developing science. We know now that the Proctor test in a laboratory does not tell us accurately how much compaction we will get in an embankment in the field; also that many runway subgrades today are carrying much heavier loads than are indicated by the CBR test. Recently, at the road-builders meeting in Washington, some of the highway engineers suggested that some "off-specification" soils will be found adequate for certain highway purposes if treated with small quantities of cement, salts or bitumen to improve their characteristics. In fact considerable emphasis at that meeting was placed on the economies that can be made through learning how to make the most of locally available soils, especially for secondary road work.

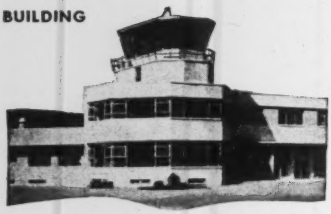
In this trend we have another demonstration of the value of an engineering approach. Scientific knowledge of soils plus practical experience is expanding the usefulness of soils that scientific analysis alone would have restricted or rejected.

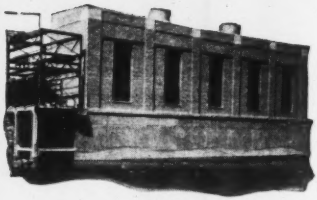
No Argument

The first session of the American Concrete Institute convention in New York last week recorded an unanimity of opinion that has seldom been equaled. It was unusual and it was significant. Devoted to "problems in concrete pavement surface durability," it revealed that there is no problem if air-entrained concrete is used. Obviously, the concrete has to be designed, mixed, placed and cured in accordance with good practice, but this practice is apparently so well established that it presents very little of a problem either. Speaker after speaker—and there were ten of them—gave testimony of good results either with interground air-entraining agents or admixtures applied to the field mix. Air entrained concrete, they agreed, resists pavement scaling from salt treatment, saves cement and reduces volume charge in mass concrete, is more workable and cures and finishes more easily.

The contrast with the doubts and disagreements recorded at a similar convention session a few years ago was marked. In the interim, more than half the state highway departments have tried, adopted and now require air entraining. The Bureau of Reclamation uses nothing but A.E. concrete. There may still be some problems for the laboratories to work on—the optimum amount of air for different types of mixes, the permissible reduction in cement content, field methods for measuring air content, other types of admixtures and the like—but the use of entrained air, in so far as designers and contractors are concerned, would seem to admit of no more argument than the use of the water-cement ratio.

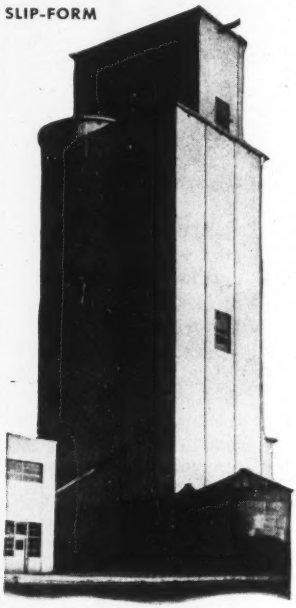
BUILDING





MASS

SLIP-FORM



DURAPLASTIC

is highly adaptable for structural work . . .

SUCCESS in many construction jobs has proved Atlas Duraplastic to be adaptable for all types of structural or mass concrete—for foundations, floors, walls, slip-form, gunite, stucco, etc.

Concrete made with Duraplastic requires less mixing water for a given slump, is easy to place and finish because it's more plastic and workable . . . more cohesive and more uniform. Water-gain and segregation are effectively minimized. Duraplastic provides the proper amount of entrained air for satisfactory performance and it protects concrete against the effects of exposure, such as freezing and thawing weather.

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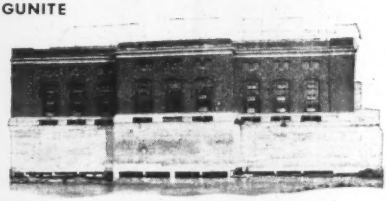

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ENR-D-80

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ENGINEERING NEWS-RECORD

MARCH 3, 1949 VOL. 142 NO. 9

Snow pack poses flood threat but offers hope to dry spots

Soil Conservation Service is more pessimistic than Weather Bureau on chances of heavy spring floods in West—High water content of snow will replenish ground water

Heavy snow cover on the plains and in the mountains of the West constitutes both a threat and a promise, government meteorologists said in recent predictions for spring. A rapid thaw and warm rains could turn the accumulated precipitation into disastrous floods. But the same snow pack promises for many regions both better-than-normal stream flow volumes and at least partial restoration of depleted groundwater supplies.

The Soil Conservation Service and the Weather Bureau have pointed up the contrasting aspects of the situation. A recent statement by the service said that "prospects for damaging spring high water flow in the Northwest and parts of the Rocky Mountain states are foreseen from the Feb. 1 snow surveys." By contrast, the Weather Bureau's water supply forecasts of the same date (for the eleven far west states) made no such alarming prediction.

As of Feb. 1, the Weather Bureau foresaw only one major flood possibility in that area. A serious flood hazard, it said, has developed in the Missouri River basin above Fort Peck.

Columbia seen no threat

For the other basins, the Weather Bureau's views are more hopeful. Speaking of the Columbia, the report says that January precipitation in the basin was very light. Precipitation well above normal must occur before spring in this basin, according to the bureau's Feb. 1 outlook, for a major flood to occur.

These observations disagree in important respects from the information put out by the Soil Conservation Service. On the basis of early-February snow survey reports from eleven states and British Columbia, the service reported that water content of snow cover on major watersheds as about 200 percent above normal in the Columbia Basin, 150 percent above normal on the headwaters of the Missouri River, 175 percent above normal in the Great Basin and the Upper Colorado, and normal on the Rio Grande, Arkansas, Salt, Gila and in Southern California.

Where the now pack is already heavy, three other factors will determine whether major floods will take place. George D. Clyde of Logan, Utah, chief of the irrigation and water conservation division for the service pointed them out. For major floods, normal slow melting in the early spring must be delayed until sudden melting occurs under higher temperatures. Next, rain must add to the runoff, and, finally, there has to be continuous melting temperature after the delayed melting and runoff starts.

The two agencies agree that conditions to Feb. 1 presage better than normal water supply this year for most areas—outside of California—in the eleven far western states, checked by recent cold snap in the higher ranges.

In California, the water supply situation on Feb. 1 was much less promising. Water-year flow volumes estimated by the Weather Bureau at that time were considerably below normal for all points in the state.

For the rest of the eleven states, water-year flow volume estimates of the Weather Bureau on Feb. 1 indicated stream runoffs falling generally in the range from normal to 30 or 40 percent above normal.

INDEX FOR VOLUME 141

An index for Volume 141 (July-December 1948) of Engineering News-Record is now available to subscribers.

Copies will be mailed to subscribers who ordered previous indexes. Subscribers who did not order previous indexes, or who have changed their address should write: The Editor, Engineering News-Record, 330 West 42nd Street, New York, 18, N. Y.

Demand off; low price homes asked

Hampered by a tightening money-market and by some lessening of the immediate postwar demand, U. S. housing construction will drop somewhat this year, members of the National Association of Home Builders were told at their Chicago convention last week.

The drop, however, will be accompanied by two things: A possible lessening in price, and a certain increase in the number of units offered for sale in lower price brackets.

The financing problem appeared to be the builders' main concern. They cited it as having caused deferment or abandonment of many projects, and heard recommendations that the interest rate be upped for veterans' loans and that mortgage maximums be raised. One builder proposed a private central mortgage bank to create a secondary market and increase distribution for mortgage capital.

Emphasis will be on building more houses in lower price ranges. Raymond M. Foley, Housing and Home Finance Agency administrator, cautioned the builders not to try to achieve this aim by sacrificing adequate livability or lessening standards. He added that costs can only be brought down by a long addition of small economies.

In a panel discussion on cost-cutting building methods, J. T. Lendrum of the University of Illinois' Small Homes Council recommended three basic steps for maximum economy: (1) Precut all lumber from a detailed schedule; (2) use nailed roof trusses rather than rafters; (3) erect walls and roof before interior partitions.

The homebuilders elected officers for 1949: President, Rodney M. Lockwood of Detroit; first vice-president, Thomas P. Coogan of Miami; second vice-president, William P. Atkinson of Oklahoma City; secretary, Nicholas F. Molnar of Cleveland; treasurer, Nathan Mamilow of Chicago.

NEWS BRIEFS

Utilities – Hydro Electric Power Commission of Ontario has bought a site in TORONTO to build a $40,000,000 steam generating plant . . . Duke Power Co. has plans for a $20,000,000 steam-electric generating plant on the Saluda River near ANDERSON, S. C. . . . A $10,000,000 generating plant is being planned by Northern States Power Co. on the Minnesota River near MINNEAPOLIS, MINN. . . . MacGregor Smith, president of Florida Power & Light Co. says that his firm will spend $22,447,200 for plant improvements and new plant construction in FLORIDA this year . . . SAN DIEGO, CALIF., Gas & Electric Co. has announced a $15,000,000 expansion program for 1949 . . . More than $18,000,000 will be spent by ALABAMA POWER CO. this year as part of its $57,000,000, three-year construction program . . . About $24,000,000 will be spent this year by the BRITISH COLUMBIA ELECTRIC RY. CO. in improvement and extension of its utility service in that province.

Hospitals–Rochester Hospital Fund has approved plans for the expansion of the General Hospital, ROCHESTER, N. Y. at a cost of $2,000,000 . . . Plans have been announced for a $10,000,000 medical and surgical clinic, with 500 beds, at PITTSBURGH, PA. . . . There has been allocated $2,818,022.40 for construction of a building for tubercular patients at PHILADELPHIA, PA. State Hospital.

Airports–BUFFALO, N. Y., is advertising for bids for reconstruction of the northeast-southwest runway and installation of high-intensity lights at Buffalo airport, an $800,000 project . . . ALBANY, N. Y. has approved $400,000 for further improvements at Albany airport. The government will spend an additional $400,000.

Housing–A 300-unit low cost housing development, FHA mortgage-financed for $2,000,000, in projects for a 90-acre plot in TAMPA, FLA. . . . Mathews Bros. will build 104 new residences in HOUSTON, TEX., this year, to cost $1,742,000 . . . In N. Y. CITY: Tishman Realty & Const. Co. Inc., will undertake a $10,000,000 apartment house rental project for 500 families near Sutton Place and the East River; bids have been taken for Dyckman Houses, a non cash subsidy project of the N. Y. City Housing Authority . . . Bids have been opened for a $5,500,000 low cost housing project in the center of WHITE PLAINS, N. Y. . . . Plans have been announced for 450 "economy houses" and 20 stores in TULSA, OKLA., to cost about $3,500,000.

Demand high purification for Ohio River pool

Treatment requirements that would virtually eliminate the discharge of suspended solids and reduce biochemical oxygen demand by 65 percent in the so-called Cincinnati Pool of the Ohio River were put before civic officials last week.

The recommendations were detailed at a public hearing in Cincinnati which marked the first action of the newly-formed Ohio River Valley Water Sanitation Commission in its drive to clean up waters of the Ohio.

Despite the fact that the commission's requirements are well above normal—and well above the minimum of 45 percent removal of suspended solids and 35 percent BOD reduction provided in the eight-state compact —public officials attending the commission hearing agreed unanimously to push programs to meet the order.

The "pool" is actually a 22.3-mi. stretch of the Ohio, between navigation dams 36 and 37, bordered almost entirely on the east bank by metropolitan Cincinnati, and on the west by a number of Kentucky communities, including Covington, Newport and Dayton. The Licking River and the Little Miami River join the Ohio in the "pool."

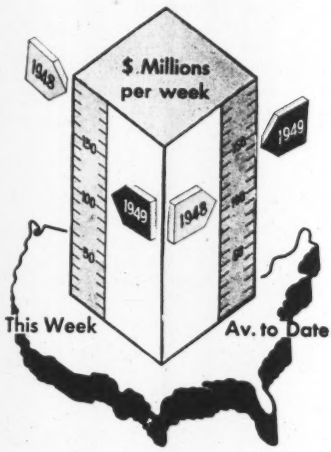
THE COVER PICTURE

Next year automobiles will begin to use the Brooklyn-Battery tunnel, whose Manhattan approach is shown under construction. Part of Battery Park, temporarily occupied by contractors' work and equipment, can be seen in the background. The bulky structure astride the twin 2-lane portals is one of the three blower buildings that will house fans for changing tunnel air once every one and a half minutes. Overall length of the tunnel is 9,117 ft.

The principal artery leading to the tunnel from Manhattan Island is the elevated West Side Highway, which ramps down to grade a block to the right of this picture. On the Brooklyn side the tunnel connects with Gowanus Parkway, which in turn leads to the Belt Parkway, on the water-bound perimeter of Brooklyn. (John A. Roebling's Sons Co., photo.)

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Mar.'49	474.80	228.24
Building Cost	Mar.'49	352.47	190.54
Volume	Feb.'49	255.	112.



Activity This Week

As reported to ENR

Amount of contracts let

(Millions of dollars, continental U. S. only)

	Week of Mar. 3 1949	Cumulative 1949 (9 wks.)	Cumulative 1948 (10 wks.)	% Chge
Federal	$17.7	$167.3	$247.0	−25
State & Mun.	33.1	408.7	347.2	+31
Total Public	$50.8	$576.0	$594.2	+8
Total Private	67.7	671.4	506.3	+47
U. S. Total	$118.5	$1,247.4	$1,100.5	+26

Contracts by type of work

	This Week	Cumulative 1949 (9 wks.)	Cumulative 1948 (10 wks.)	% Chge
Waterworks	$1.4	$21.4	$32.1	−25
Sewerage	3.5	33.6	29.7	+23
Bridges	2.8	65.1	40.6	+76
Highways	5.9	82.7	131.5	−30
Earthwork, Waterways	3.3	65.2	124.3	−42
Buildings, Public	30.2	268.3	200.4	+49
Industrial	16.6	180.7	131.9	+52
Commercial	47.9	432.3	331.5	+45
Unclassified	6.9	98.1	78.5	+40

NOTE: Minimum size projects included are: Waterworks and waterway projects, $25,000; other public works, $50,000; industrial buildings, $65,000; other buildings, $250,000.

New capital for construction

	1949 (9 wks.)	Cumulative 1948 (10 wks.)	% Chge
NON-FEDERAL	$866.1	$571.9	+68
Corporate Securities	417.6	327.9	+41
State and Municipal	448.5	244.0	+104
Total Capital	$866.1	$571.9	+68

ACI debates stress changes, scaling

Air entrainment for better concrete and bond stresses for new-type deformed bars were the top subjects discussed at the 45th Annual Convention of the American Concrete Institute in New York City last week. The first related to existing practice, while bond stresses must still run the gamut of more committee action before they are official.

The committee on bond stresses recommended to the building-code committee changes in allowable working stresses in bond, predicated on extensive research sponsored by the American Iron and Steel Institute over the past six years. The major change is permitting a bond stress for the new bars equal to 10 percent of the concrete strength, with no additional allowance made for hooks.

Tests have demonstrated that because of the better grip of the deformations of the new types of bars bond is supplied along the length of the bars where it is needed, and the addition of hooks adds little or nothing to their effectiveness. An exception is made for horizontal bars placed in the tops of beams or girders, because these bars are deficient in bond resistance due to settlement of the concrete and the resulting reduction of surface contact. The bond stress for the improved types of deformed bars for this situation was recommended to be 7 percent of the concrete strength.

Corresponding values for plain bars hooked at the ends were recommended to be 4½ percent of the concrete strength for the general case and 3 percent of the concrete strength for bars placed in the tops of beams or girders.

In accordance with current design practice for two-way footings, allowable bond stresses are held to 80 percent of the values used above.

In all cases, ceiling or maximum values are specified as in the present ACI standard building code. After approval by the ACI building-code committee, changes will also have to be made in the ASTM deformed-bar specification, a 305-47 T.

Pavement scaling discussed

Ten speakers reported good results with air entrainment in preventing scaling of concrete pavements caused by de-icing chemicals. It was brought out that many state highway departments and federal agencies, such as the Bureau of Reclamation, use air-entraining concrete almost exclusively. The consensus was that the concrete should have an air content of at least 3 percent, but preferably about 6 percent, to obtain satisfactory durability.

A different phase of the scaling problem was analyzed by B. D. Tallamy, superintendent of the New York State Department of Public Works, who pointed out that application of raw salts has become increasingly common to speed ice removal with as much as 600 lb. per two-lane mile being used. The pavements, especially those under two years old, have been found to be unable to withstand the straight salt.

After laboratory investigations indicated the feasibility of oil-solvent mixtures as a protective coating, applied with pressure distributors, nearly 60 miles of new concrete highways were treated in the late summer of 1948, the mixture consisting of equal parts of Stoddard solvent (non-flammable) and a petroleum distillate with an approximate SAE number of 5, with the truck applying the mixture moving at 2 mph., 1/15 gal. of oil per sq. yd. (25 percent more than necessary for optimum results) was deposited on the new pavement. The oil was absorbed within 15 min. Total cost of the treatment was about one cent per sq. yd. Mr. Tallamy estimated that the coating should be applied every two years to bad road sections.

COSTS-SURVEY ISSUE DUE MARCH 17

What construction will cost—plus a look at the future and trends in the industry—will be the backbone of Engineering News-Record's combined Annual Survey and Construction Cost Number, to be published March 17.

The major indexes and tables that have distinguished the Costs Issue for so many years—and have proved such valuable tools for engineers and contractors—will be retained for selected years in the combined issue.

In addition, a 23-page survey and forecast of the construction industry and its major trends; plus a complete inventory of all major projects of 1948, with their status and prospects, will be a part of the issue.

An "extra" will be a 16-page insert of construction business data, including: forecasts and records of construction volume; material and labor supply and costs; housing; 1949 highway programs, and construction financing. Reprints of this special insert will be available on order at 25 cents each.

The combined issue will be received as usual by all regular subscribers. A limited number of extra copies will be available at $2.00 per copy.

New data on footings

Tests on reinforced concrete wall and column footings, reported by Frank E. Richart, research professor of engineering materials, University of Illinois, apparently furnish definite proof that the tensile and bond resistance depend upon the bending moment and shear found by statics by consideration of the full applied load, and not 85 percent of the load as assumed in current building codes. Hooked ends on bars showed no particular advantage in bond resistance over straight bars, particularly when deformed bars were used. Also, the effect of hooked bars on resistance to diagonal tension was much less than is commonly assumed.

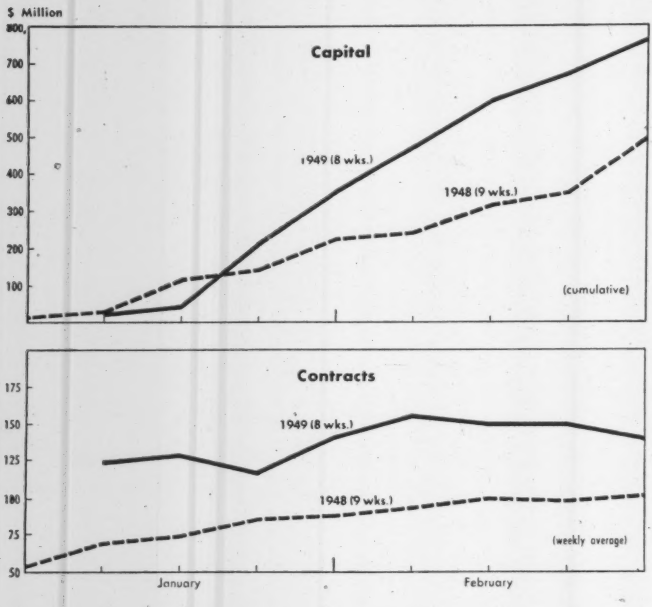
Welded mats, Professor Richart said, proved particularly effective in resisting end slip of bars. Another important conclusion was that diagonal tension apparently is the weak point in current design practice.

Several requirements for good architectural concretes emerged from two detailed and authoritative papers by John J. Hogan and E. B. Oberly of the Portland Cement Association. The authors recommended that designers show all construction, expansion and control joints on their plans. Control or dummy joints should be used to eliminate cracking around openings; they are more effective than extra reinforcing.

Lightweight aggregate

Some properties of lightweight aggregate concretes were reported by M. M. Sparks and E. C. Tuma of the National Bureau of Standards and Prof. Ralph W. Kluge of Purdue University. The investigations included concretes weighing as little as one-fifth the weight of ordinary stone concrete. At the lower weights, strengths were low, but thermal conductivities were one-tenth that of conventional concrete. On the other hand, some of the lightweight concretes with one-half to two-thirds the weight and one-third to one-half the thermal conductivity of sand-gravel concrete had strengths equal to or greater than the latter type. However, because of high absorption characteristics, shrinkage in the light concretes might be double that of the heavy.

Actions taken by the ACI included approval of a Recommended Practice for the Application of Paint to Concrete Surfaces. Prof. Herbert J. Gilkey of Iowa State College was elected president and Frank H. Jackson and Harry F. Thomson, vice-presidents.



Building contracts and new capital set high February records

Engineering contracts in February average $141 million per week for a $563 million total, the highest for the month since 1942. This is 18 percent higher than February 1948, and less than 1 percent below the record January 1949 total.

These two unseasonably high months have seen $1,128 million in heavy construction go under contract, a 39 percent increase over the 2-month awards rate of 1948.

Private contracts in February, with a weekly average of $93 million are 62 percent higher than January, and 64 percent above February a year ago. This is largely due to the record high weekly average for industrial buildings (including utilities), of $31 million and for mass housing of $38 million per week. Total private volume for the month is $374 million; industrial building, $123 million; commercial building including mass housing, $221 million, and private unclassified, $29 million.

Public contracts average $47 million, 44 percent below January 1949, and 23 percent below February 1948. Federal activity was abnormally low at $5 million per week. Total federal for the month is $20 million, total state and municipal is $169 million. Public building totals $73 million of which $27 million is for housing. Streets and roads are low at $30 million, 37 percent below January and 26 percent below February, 1948. Bridge awards are high at $32 million, which includes the Delaware Memorial Bridge award of $13 million. Waterworks, $10 million; sewerage, $12 million; public unclassified, $20 million; and earthworks, irrigation and drainage, $12 million, complete the picture. The latter low, 76 percent below January, and 83 percent below February, 1948.

New construction capital from security sales in February totals $405 million, 13 percent above January, and 50 percent higher than in February a year ago. State and Municipal bonds accounted for $207 million and corporate securities for $198 million.

Total new capital for the year to date is $764 million. This averages 74 percent more construction money coming into the construction market this year than a year ago. Corporate security sales to finance construction are running 67 percent ahead of last year, and state and municipal bond sales, 84 percent ahead.

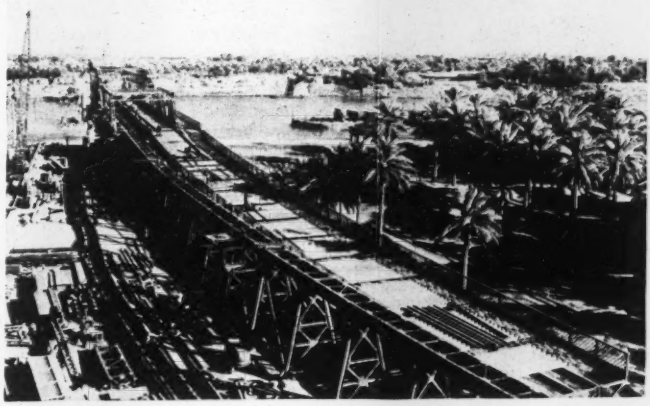
ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—FEBRUARY, 1949

Engineering News-Record *reports continental U. S. Construction project of the following minimum costs—Waterworks, excavation, drainage and irrigation,* $28,000; *other public works* $50,000; *industrial buildings,* $68,000; *other buildings,* $250,000

Four Weeks—Thousands of Dollars (000 Omitted)

	February, 1949						Total U. S. Cumulative Two Months				
Public Works	New England	Middle Atlantic	South	Mid West	West of Mississippi	Far West	U. S.	1949	1948	% Change '48–'49	Canada Feb. '49
Waterworks	850	2,071	2,135	298	3,897	1,044	10,295	19,915	29,326	− 32	713
Sewerage	66	1,351	957	3,393	3,137	2,969	11,873	30,123	25,160	+ 20	428
Bridges	2,137	24,682	1,974	580	2,277	699	32,349	62,102	32,922	+ 89	.....
Earthwork and waterways	373	1,871	2,309	50	5,879	1,421	11,903	61,861	97,951	− 37	212
Streets and roads	210	6,257	4,879	1,032	13,669	3,645	29,692	76,772	105,689	− 27	940
Public buildings, residential	.....	23,615	1,966	.....	620	980	27,181	57,890	14,012	+313	405
Other public buildings	2,917	10,425	8,081	5,214	13,915	5,405	45,957	180,206	143,569	+ 26	1,653
Unclassified	547	6,076	2,251	104	3,111	7,841	19,930	36,323	33,430	+ 9	1,697
Total public	**7,100**	**76,348**	**24,552**	**10,671**	**46,505**	**24,004**	**189,180**	**525,192**	**482,059**	**+ 9**	**6,048**
Federal government (included in above classifications)	377	2,786	3,264	22	7,953	5,373	19,775	149,672	190,415	− 21	440
Private											
Bridges	.....	.....	.....	.....	89	.....	89	219	.....	.....	1,222
Industrial buildings	1,022	7,247	12,752	13,770	16,304	72,364	123,459	164,155	116,111	+ 41	11,154
Com'l. buildings, residential	2,250	68,300	11,910	4,589	54,941	11,752	153,742	269,122	193,140	+ 39	11,150
Other commercial buildings	5,913	40,818	4,775	1,105	7,784	6,840	67,235	115,279	83,983	+ 37	2,497
Unclassified	.....	.....	5,027	600	18,752	5,000	29,379	54,943	41,305	+ 33	3,310
Total private	**9,185**	**116,365**	**34,464**	**20,064**	**97,870**	**95,956**	**373,904**	**603,718**	**434,539**	**+ 39**	**29,333**
Total Engineering Construction:											
February, 1949—4 weeks	**16,285**	**192,713**	**59,016**	**30,735**	**144,375**	**119,960**	**563,084**	.....	.....	.....	**35,381**
January, 1949—4 weeks	20,506	145,634	126,986	75,441	136,509	60,750	565,826	.....	.....	.....	28,385
February, 1948—4 weeks	18,454	122,760	70,055	54,703	150,327	58,344	474,643	.....	.....	.....	71,671
Two Months—1949	**36,791**	**338,347**	**186,002**	**106,176**	**280,884**	**180,710**	.....	**1,128,910**	.....	.....	**63,766**
Two Months—1948	55,025	239,522	168,258	91,802	267,805	94,186	.....	.....	916,598	.....	71,671
% Change '48 to '49	−33	+41	+11	+16	+5	+92	.....	.....	.....	+ 23	.....

DEVELOPMENTS ABROAD



TO CROSS THE TIGRIS—This, the first railroad bridge ever to span the river Tigris, is being built by British contractors with Iraqi labor at Baghdad, Iraq. Replacing an old river ferry, the steel structure will link the west bank and all of Turkey with the east and Persia. (British Combine Photo)

Power and Irrigation

New Zealand—Electricity demand is rising even faster than power capacity is expanding, because practically all new construction in the dominion is based on hydro projects that require many years for completion. Dominion authorities are now giving serious thought to the installation of both coal and oil burning steam plants to avoid disruption of manufacturing activities. While New Zealand has neither much coal nor sufficient overseas credit for imports of fuel oil, there is an ample hydro-electric potential that the government is eager to develop.

There is expected to be a 10 year power shortage throughout both the North and South Islands while the hydro capacity is being developed.

New Guinea—Final arrangements are being made for the construction of a 3,000 kw. hydro station on the Laloki River, a few miles upstream from Port Moresby.

Of eastern New Guinea's estimated hydro-electric potential of 20,000,000 hp., only 5,000 hp. has been developed so far. A British aluminum concern, with the backing of the British government, is trying to interest the Australian government in the large-scale development of hydro power in New Guinea.

Ceylon—The Boise, Idaho, contracting firm of Morrison-Knudsen Co., Inc., has been awarded a $10,500,000 contract by the Ceylon government for construction of a hydro-electric dam on the Galoya River.

Water Supply

Australia—A 6,200-ft. tunnel through Mount Little Joe, near Melbourne, has been completed by the Metropolitan Board of Works. Excavation began on March 1, 1947, from both sides of the mountain.

The tunnel will provide a conduit section for a 23-mi. pipeline which the board is laying from the Upper Yarra to the Silvan reservoir—principal Melbourne water supply reservoir.

India—A five-year development plan of the Bombay government includes the spending of $7,500,000 on the construction of new wells and improvement of existing wells. Also, $19,000,000 would be spent on major irrigation projects. These figures were given by Bombay's Public Works and Health Minister, Dr. M. D. D. Gilder, at a meeting in Bombay on Jan. 10.

Miscellany

England—What will be one of the world's largest draglines is under construction here for shipment to Australia. The machine will carry a 20 cu.yd. bucket on a 282-ft. boom and will weigh 1,500 tons. The boom will be of tubular construction and will be built in Australia.

Australia—Serious deterioration of main outfall sewers through sulphurated hydrogen attack is "too common" an occurrence, and the Melbourne and Metropolitan Board of Works has organized to carry out research into the fundamental processes involved.

Work on this program has advanced to the stage of a qualitative understanding of most of the underlying processes, and the work is being continued to provide the necessary quantitative information.

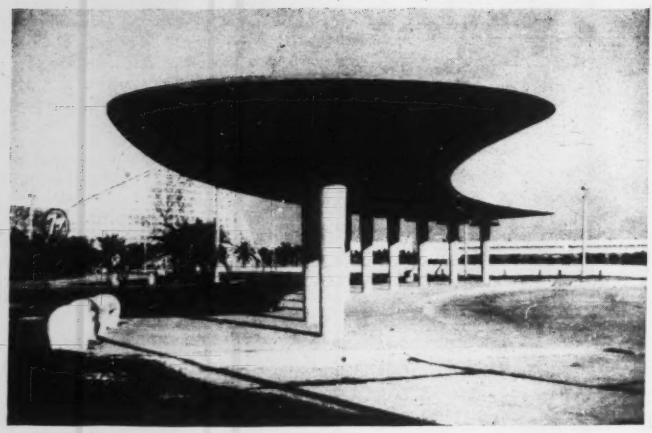
Experiments to determine the effectiveness and economy of sewage treatment by high rate filtration with mechanically ventilated filters have shown that the partial purification necessary to stabilize the material against sulphurated hydrogen generation can be achieved by this method. The treatment reduces the biochemical oxygen demand from 600 ppm. to 100 ppm.

Eritrea—According to information released by the British War Office, the Eritrean Ropeway has been put up for sale. This 40-mi. cableway connects Asmara and Massawa and was designed and built for the Italian government by the firm of Cerretti and Tanfani of Milan in 1937.

The largest span between pylons is about 4,600 ft.; capacity of the cableway is 300 tons each way per 8-hour shift with a speed of about 15 miles per hour.

Having been maintained in working order, the cableway is considered a practical project for dismantling. Any correspondence on the question should be addressed to Brig. L. G. Robertson, O.B.E., Deputy Director of Claims, The War Office, Piccadilly, London, England.

GLASS AND CURVES, plus air-conditioning, make this Buenos Aires office building somewhat unique. To house government offices—notable for paper work—the structure has a built-in pneumatic tube shipping system.



BEAUTIFIED BUS STOP—Passengers from Ponchartrain Beach, New Orleans, are sheltered while awaiting buses by this reinforced concrete structure. Ten tapered concrete columns support the 136-ft. long slab, which is 23 ft. wide and has a minimum thickness of 3 in. at its outer edge. The full width of 20-ft. walkway was used to spread vertical loads and resist overturning moments. Freret and Wolf, New Orleans architects, were the designers. The contractor was Byrd and Bruns, New Orleans.

TVA explodes charge; 1 1/3 million pounds

A "coyote hole" type of shot containing 1,360,000 lb. of explosives and estimated to produce something over 1,500,000 cu. yd. of rock (loose measure) was exploded recently by the Tennessee Valley Authority as their second large quarry blast in connection with construction of the South Holston Dam.

A total of 5,135 lin. ft. of 4x6 ft. tunnel galleries was driven in preparation for the loading of the blast. The previous blast at the South Holston quarry, discharged July 14, 1948, contained 840,000 lb. of explosives and produced 950,000 cu. yd. of rock. (ENR July 29, p. 2)

The present blast was somewhat over 50 percent larger than the previous one and was the largest blast ever discharged, aside from military operations, TVA officials said.

A single detonator was used, and primacord of varying lengths led to each of the three tunnel systems. This gave a slight delay between initation of firing in the different tunnels and helped to dampen the seismic effect of the blast.

South Holston Dam is a multiple purpose structure which will form a part of the water control system of the TVA on the Tennessee River. It is an earth and rockfill structure containing 5,800,000 cu. yd. of fill. Approximately one-third of the fill has been placed to date.

States propose to study new dam on Delaware River

Bills have been introduced simultaneously in the legislatures of New York, New Jersey and Pennsylvania proposing one or more dams on the upper Delaware River to provide for future water supply.

This proposal asks that a $200,000, two-year survey be made to determine the feasibility of an integrated water project in the Delaware River basin above Trenton. Each state would bear an equal share of the expense.

Studies would be made by the Interstate Commission on the Delaware River Basin (Incodel), as well as the three mentioned above.

Court orders pay-off on water hammer damage

A verdict returned in the Madison, Wis., federal district court recently has ordered payment of over $25,000 damages to the L. L. Olds Seed Company of Madison by the Commercial Union Assurance Co., Ltd., New York.

After hearing two days testimony by experts, the jury stated in its findings that water hammer caused the damage, and the damage was covered by the $550,000 policy of the seed company.

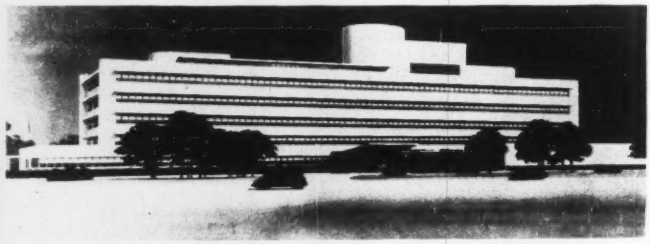
Rupture of a pipe which caused flooding of an entire basement occurred in November, 1946. At that time the Commercial Union Assurance Company, Ltd., ruled that the resulting damages were not covered under the seed company's policy.

BTEA elects H. M. Hughes to succeed P. W. Eller

Hugh M. Hughes recently was elected president of the Building Trades Employers' Association of New York, succeeding Peter W. Eller, newly appointed chairman of the board of governors (ENR Jan. 27, p. 10).

Mr. Hughes is president of the H. M. Hughes Co., Inc., New York City general contractors. Other officers elected by the 1,000 members of the 23 trade associations affiliated with the BTEA were:

Vice-president, Fred J. Driscoll, president of the George F. Driscoll Company; second vice-president, Eugene Duklauer, president of Eugene Duklauer, Inc.; third vice-president, Perry S. Dewey, of the Christie Cornice and Skylight Works, Inc.; treasurer, J. George Costello, president of the Costello Concrete Construction Co.



EXTREME FLEXIBILITY is sought in construction of Esso Standard Oil Co.'s six-story, $3,000,000 office building at the Baton Rouge, La., refinery. The steel frame and brick structure will have movable steel partitions, windows spaced uniformly at 4-ft. centers, and mechanical services designed for easy changes. Completely air-conditioned and fireproof, it was designed by architect Lathrop Douglass, and John W. Harris Associates of New York are the engineer-builders.

ENGINEERING SCHOOLS

Harbor Studies

The University of Michigan is to proceed with model studies for the proposed small boat harbors of refuge for Port Austin and Port Sanilac, Mich., according to Col. Louis J. Rumaggi, Detroit district engineer, Corps of Engineers. These will be the first such studies for the Detroit district's eastern Michigan shoreline development for the proposed Great Lakes chain of harbor protection for light-draft vessels, authorized by Congress in 1945.

Model studies for the two harbors, will be conducted under the direction of O. Wisler, professor of hydraulic engineering, and E. F. Brater, professor of civil engineering. The models will be constructed and tested in the new wave tank at the university's Willow Run laboratory.

The primary objective of the studies is to determine the arrangement of breakwaters that will provide the maximum protection from storm waves on Lake Huron for craft entering and lying within the harbors. A secondary purpose will be to find the best protection against undesirable currents, particularly at the entrance to the harbors, and against erosion and sedimentation within and near the harbors.

Scale models of the harbors will be built in the wave tank which is 60 ft. wide, 100 ft. long and 3 ft. deep. A 40-ft. wave machine, similar to those used at the U. S. Waterways Experiment Station, Vicksburg, Miss., will provide the simulated storm action. The tank can accommodate scale models 30 by 25 ft. allowing about 30 ft. of free water space on three sides of the model. The Port Austin and Port Sanilac Harbor of Refuge models will be built with an undistorted scale of 1 ft. equal to 75 ft.

Faculty News

A. A. Brielmaier, formerly on the faculty of the University of Illinois and of Pennsylvania State College, has been appointed professor of civil engineering at Washington University in St. Louis, Mo., where he will teach structural engineering.

Lionel Boulet and Theodore Wildi have been appointed professors in the engineering department of the Laval University Faculty of Science, Quebec.

Alfred M. Freudenthal, associate professor of bridge design at the Hebrew Institute of Technology, Haifa, Palestine, has been appointed research professor of theoretical and applied mechanics, University of Illinois, effective Sept. 1, 1949. He was at Illinois as visiting professor of applied mechanics in 1947-1948, and as lecturer and consultant in the same department, 1948-1949. James F. Halsey, assistant professor of hydraulic engineering, Louisiana State University, Baton Rouge, La., has been named research assistant professor of fluid mechanics at Illinois, under a two year appointment, effective in September.

Dr. Thorndike Saville, dean of New York University's college of engineering, has been appointed sanitary engineering member of the National Advisory Health Council.

Engineering Materials

Parallel departments in two engineering divisions at Cornell University have been consolidated in a new Department of Engineering Materials. The units are the departments of engineering materials in the school of civil engineering and in the Sibley school of mechanical engineering, both of which were established at the opening of the university in 1868. D. F. Gunder, was named acting head of the new department. Dean S. C. Hollister of the college of engineering said the consolidation will permit closer coordination of instruction and more effective use of the elaborate equipment used in the materials field. The new department occupies various laboratories but eventually will be housed in the materials and metallurgy laboratory projected in the long-range development program of the college.

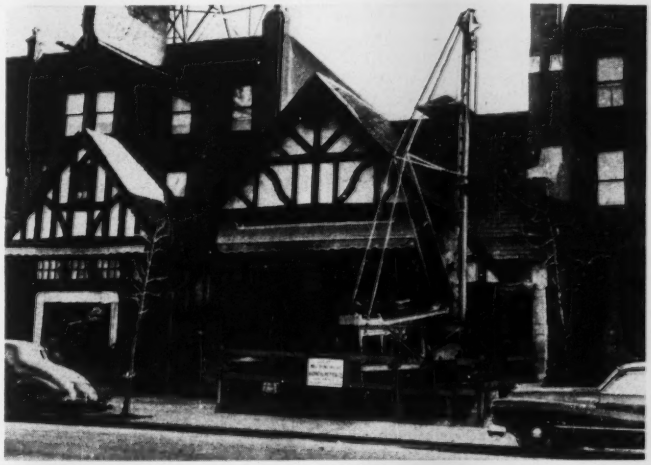
Educational Notes

A total of $33,913.50 has been invested in 136 scholarship awards at Illinois Institute of Technology during the current semester.

North Carolina State College has let contracts to five firms in the state for its new $1,245,151 engineering laboratories to be completed in June, 1950.

The university extension department of the University of California and the Institute of Transportation and Traffic Engineering held the first California institute on street and highway problems early in February at Berkeley.

Plans for a course in the fundamentals of home building have been announced by the Commercial Trades Institute, Chicago. The course takes up all phases of the home building business, including methods of construction, reading plans and specifications, letting contracts and sub-contracts, and proper methods of financing and cost accounting. An important feature is a complete set of architectural plans and specifications for a modern 6-room house of Dutch Colonial design.



NO MORE "CHLORINE COCKTAILS"—The taste of Philadelphia water has recently become a boon to local well drilling contractors. This scene, in the heart of the city, is now rather common as individuals and industries drill 450 to 500 ft. at $7 per ft. in search of more and better water. City ordinances permit this practice.

MUNICIPAL AFFAIRS

Civic Centers

A number of cities are considering the creation of civic centers, most of them to include some form of war memorial. For example:

A scale model of the proposed civic center for **Detroit, Mich.**, was recently placed on exhibition. Shown in the model are the Veterans' Memorial, now under construction; the circular convention hall to seat 17,000; a civic auditorium to seat 3,400, restaurant, band shell and amphitheater.

At a recent joint meeting of the city commission, board of county commissioners and representatives of the committee on city, county and school improvements of **Jacksonville, Fla.**, tentative plans were revealed for the development of a 6-block St. Johns River waterfront area to accommodate a new city hall, Duval County courthouse, civic center, off street parking area and other projects to cost an estimated $12,700,000.

A civic center is also proposed at **Tampa, Fla.** It might be built around a memorial park and Hillsborough County's new court house. The plan is urged by E. J. Thompson, engineer. A new city hall, a library and museum, an auditorium, and a state or federal building are among the suggested structures to be included.

In **Milwaukee, Wis.**, an area just west of Juneau Park has been selected by Metropolitan Milwaukee War Memorial, Inc., as the site for the war memorial. The veterans' unit will be built first and other units in the next five or ten years.

Municipal Briefs

Robert Moses, N. Y. City construction coordinator, reports that the city's program of arterial highways, estimated three years ago to cost $429,000,000, has been cut almost in half, mostly because of rising costs of material, equipment and labor.

The city commission of **Albuquerque, N. M.**, has appointed a city advisory planning commission to advise it on matters affecting city planning.

New York State has presented to the city of **Lackawanna** its master plan for the development of an arterial route system for that city and vicinity. Under current prices, projects would cost an estimated $2,790,000. This is in addition to the amount which will be spent for that portion of the Erie Thruway to be constructed in and near Lackawanna. Under terms of the state highway law, $2,547,000 would represent the state's share, the city to pay the remaining $243,000.

After a thorough survey of seven sites in **Milwaukee, Wis.**, C. J. Otten, economist for the U. S. Department of Agriculture, has recommended a 61-acre area southwest of W. Lincoln Ave. and S. 35th St. for the proposed $2,500,000 public wholesale produce market.

City Engineer Nelson F. Pitts of **Syracuse, N. Y.**, recommends the expenditure of almost $9,000,000 for a new sewage treatment and disposal plant to end pollution of Onondaga Lake. This follows a survey made as a result of a directive of the State Department of Health and Conservation. He estimates that enlargement and reconstruction of the present plant to meet state requirements would cost $8,700,000.

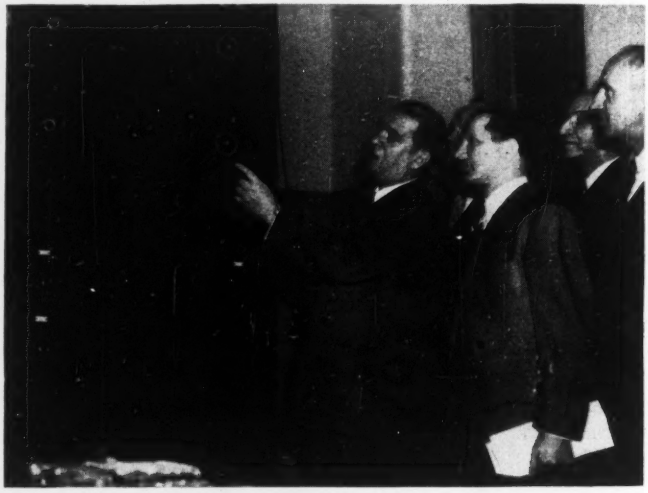
Legislative creation of "a proper and adequate transportation authority" to take over and administer the transit system of **Buffalo, N. Y.**, has been called for by the City Planning Association.

Mayor Arthur N. Harriman of **New Bedford, Mass.**, found no takers recently for a $1,000,000 municipal sewer contract. Contractors gave these excuses: Men and equipment too busy to take on such a large contract; just been awarded a big contract; costs of materials—particularly steel—so unsettled, we don't dare to take a chance. At Tulsa, Okla., when local contractors refused to bid on a major street improvement project city officials called on outside concerns to bid.

The largest one-year program ever attempted by the service department of **Cleveland, Ohio**, calling for expenditure of $6,500,000 for construction and repair of streets, sewers and bridges, has been announced by Director Samuel F. David. The street program lists $2,101,510 for resurfacing of 67 city streets, totaling 33 miles.

Akron, Ohio, has completed arrangements to finance its $8,000,000 sewage disposal plant enlargement project. Part of the plan is to issue about $3,375,000 in mortgage revenue bonds to be paid off by sewage treatment fees charged in addition to water bills.

Resurfacing of more than 12 miles of streets will be undertaken in **Vancouver, B. C.**, this year at a cost of about $3,000,000.



TRAFFIC SIGNAL CONTROL for all Manhattan eventually will stem from this central point in New York City. Mayor William O'Dwyer inspects the new installation at the West 30th St. police station. Jacob S. Katz (center), police department chief engineer, helped develop the new system. (Wide World Photo)

Truman sends invitation to road safety meeting

President Truman has sent a written invitation to the governors of the states and territories, asking their participation in the Highway Safety Conference to be held in Washington June 1-3.

This will be the first full-scale session of the conference since 1946, at which time the first meeting was called to deal with what the President at that time called an "alarming increase in traffic accidents."

In his present invitation the President points out that the problem is still of such magnitude as to be deemed worthy of the efforts of the group to stimulate public interest in safety measures.

Report planning progress for Mexico ASCE meeting

Plans for the American Society of Civil Engineers meeting at Mexico City, Mexico, July 13-15 are well advanced, ASCE board members were told recently.

Reporting on the meeting, a special committee headed by Charles M. Upham of Washington, D. C., stressed that the meeting would not be any more expensive—as far as the society is concerned—than if the session were to be held in the western section of the United States. When the meeting in the Mexican capital was planned, the board agreed that the society would not pay any mileage allowance to any board or committee members for travel outside U. S. borders.

Other future meetings of the society are scheduled as follows: In 1949—Oklahoma City, April 20-23; Washington, D. C., Nov. 2-4. In 1950—New York, Jan. 18-20; Los Angeles, April 19-21; Toronto, July 12-14; Chicago, Oct. 11-13.

Oliver J. Todd returns to China as ECA engineer

Oliver J. Todd, of Palo Alto, Calif., recently returned to China, where he has spent many years as an engineer, to serve as a consulting engineer with the Joint Rural Reconstruction Commission as a member of the staff of the Economic Cooperation Administration for China. His work will be mainly in the stabilization of the country's food supply.

Mr. Todd left his professional field briefly to run unsuccessfully for the Democratic nomination for Congress in his California district last year.

He has spent about 20 years in civil engineering in China, going there in 1919 to help with surveys and studies of the Grand Canal. He has worked with Yellow River problems and in irrigation and road building. Most recently he worked with UNRRA as adviser to the Yellow River Conservancy in 1946-47 (ENR Aug. 29, 1946 p. 4).

COAL PROCESSING PLANT, nearing completion on the Monongahela River at East Fredericktown, Pa., will clean, size and separate 2,000 tons per hour. A 1,000-ft. suspension bridge will bring belt-conveyed coal from mine to plant. This span and 10 buildings are being built for Jones & Laughlin Steel Corp. by F. H. McGraw & Co. of New York.

Southern lumbermen argue against minimum wage hike

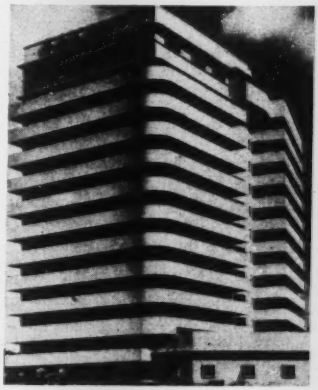
Lumber producers testified against the proposed 75-cent increase in the minimum wage at recent hearings of the House Labor Committee. Southern producers feared a shut down of many mills might result if they were caught between falling prices and rising costs.

Robert Darrah of Birmingham, Ala., secretary-manager of the Southern Wholesale Lumber Association, said demand for lumber is falling off, and there is "every indication" that producers will have to lower prices. They can't do that and increase wages, too, he said.

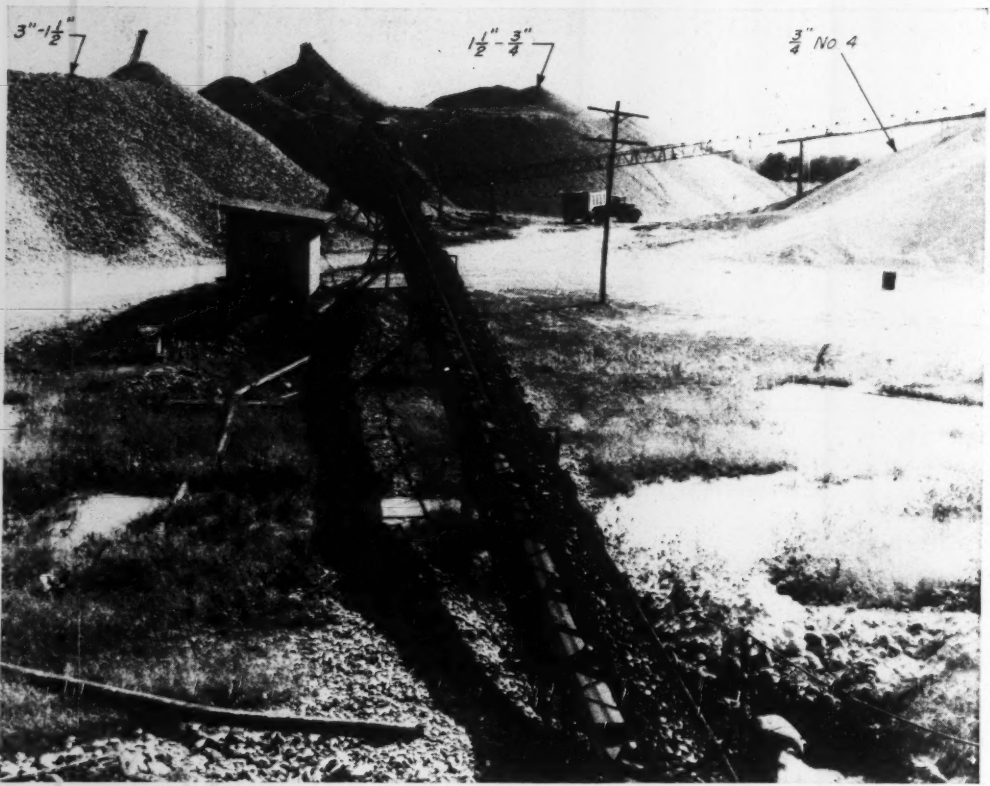
G. C. Rogers of South Newport, Ga., representing the Southeastern Lumber Producers Association, predicted that, if Congress passes a law raising the minimum wage to 75 cents or more an hour, "nearly all the 'teckerwood' mills in the South will be forced to shut down and thousands of men will lose their jobs."

FPC OK's $20 million gas pipeline 268 miles long

The Federal Power Commission has authorized Atlantic Seaboard Corp. and Virginia Gas Transmission Co. to construct 268 miles of 26-in. pipeline from Glendenin, W. Va., to Rockville, Md., including a multiple crossing of the Potomac River near Rockville and regulating equipment at various points on the line. Total cost of the facilities is estimated at $20,000,000.



MIAMI BEACH LUXURY is exemplified by this $5,000,000 hotel built in a nine-month race to be ready for winter vacationers. An acre of glass, automatic room-control air-conditioning and broad balcony terraces are featured. (Acme Photo)



Man-made mountains of screened gravel were the first step in processing . . .

Concrete Materials for Narrows Dam

NOTHING that might seriously interrupt concreting operations on the Narrows Dam was left to chance. Located on the Little Missouri River near Murfreesboro, Ark., the dam is currently about one-third complete. Completion is scheduled for Jan. 15, 1950.

Nearly 500,000 cu. yd. of sand and gravel—for the 300,000 cu. yd. of concrete in the 185-ft. high gravity-type dam and power plant—were screened to size and stockpiled well in advance of job requirements. An access road, graded and graveled under a previous contract, was bituminous treated to reduce maintenance and insure all-weather haulage of materials.

A completely automatic batching and concrete mixing plant was set up at the damsite near the headtower of a cableway system serving the construction area. Additional stockpiles of sand and gravel are maintained adjacent to the plant, together with a 4,750-bbl. cement silo to insure ample supplies of concrete materials available for use at all times.

A complete refrigeration system was installed for cooling the gravel and mixing water for concreting during hot weather. A special electrically-operated car transfers concrete from mixing plant to cableway, and special buckets place it in the forms.

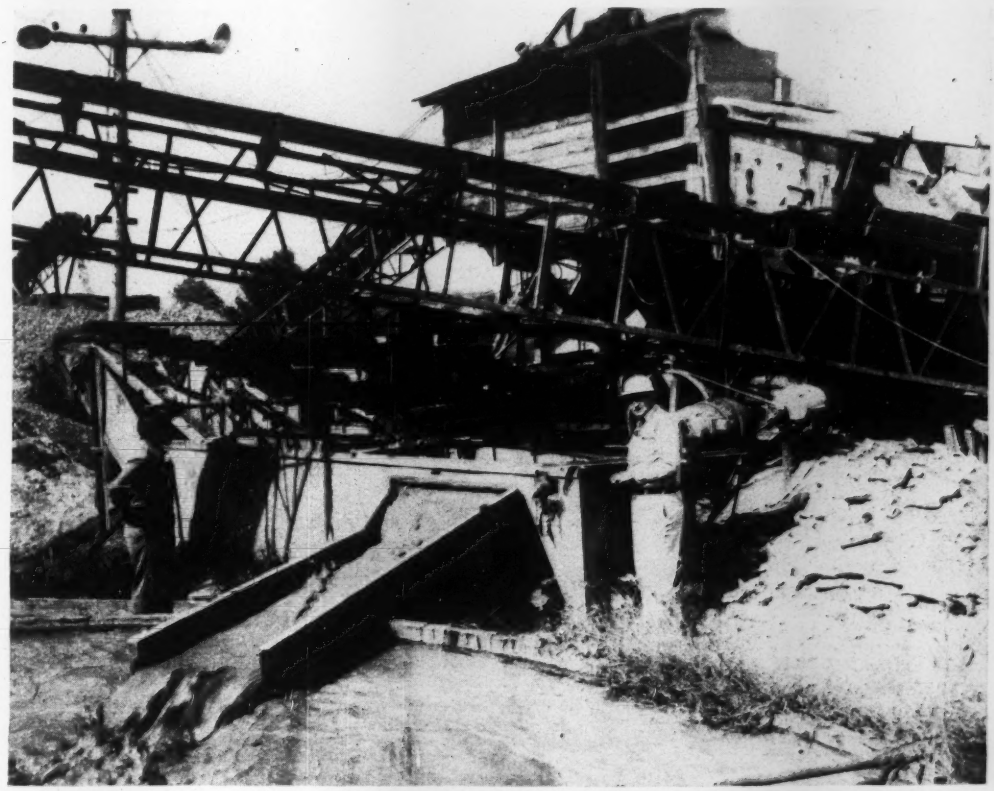
Processing the aggregates

Narrows Dam is a Corps of Engineers project for combined flood control and the generation of electric power. Details of its physical features and methods employed in making the three stages of river diversion, were described in a previous article (ENR Feb. 17, 1949, p. 70).

Production of all sand and gravel required for the entire job was completed last Dec. 1 in a huge screening plant capable of processing 2,500 cu. yd. of material per 8-hr. shift. No crushing was necessary to get a properly graded and sized sand from natural deposits nearby.

The aggregates were taken from gravel bars in the Little Missouri River 9 mi. below the damsite, loaded by draglines into four 8-cu. yd. dump trucks and hauled to the nearby screening plant. They were dumped into a feed chute and then passed on to a plate feeder and feed belt leading to a 6-in. scalper.

The oversize across the scalper (a relatively small amount) passed through a



VARIABLE-SPEED SAND WASHERS produced properly graded and blended sand, while settling tank and sand pump recovered five percent of "fines" from the waste-water line in order to meet Government requirements of the concrete mix. An overhead conveyor carried 3- to 6-in. gravel from the triple-deck screen to a stockpile located adjacent to the plant.

primary crusher and was blended with the material passing through the scalper, which was then carried to a huge surge pile. The aggregates were transported throughout the screening plant by nine 24- to 36-in. endless conveyor belts, having runs from 80 to 355 ft. and operating speeds of 110 to 320 ft. per min.

From the surge pile the material passed to a washer and triple-deck screen. Material over 3 in. was carried to the 6- to 3-in. stockpile. Sand was delivered by sluiceway to sand washers, and the remaining gravel went on to a double-deck screen. Here it was screened to three sizes, 3- to 1½-in., 1½- to ¾-in. and ¾ in. to No. 4 and carried to the three stockpiles. Both the 6- to 3-in. and 3- to 1½-in. aggregate stockpiles had rock ladders to prevent undue breakage of the gravel.

Sand from the triple-deck screen was washed a second time by four drag-type sand washers. A properly graded and blended sand was delivered continuously onto the conveyor belt leading to the sand stockpile, by varying the rates of feed from the four washers.

Additional fines needed

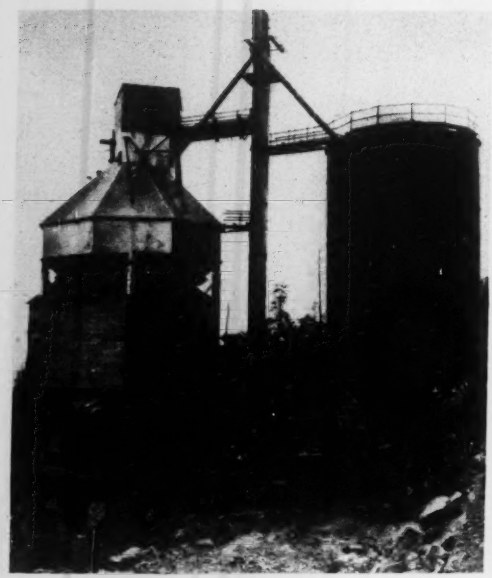
Additional fines (sand passing a 100-mesh screen) were needed, however, to meet job requirements. A settling tank with sand pump, installed in the waste-water line from the sand washers, recovered about 5 percent fines, sufficient to satisfy demands of the concrete mixes.

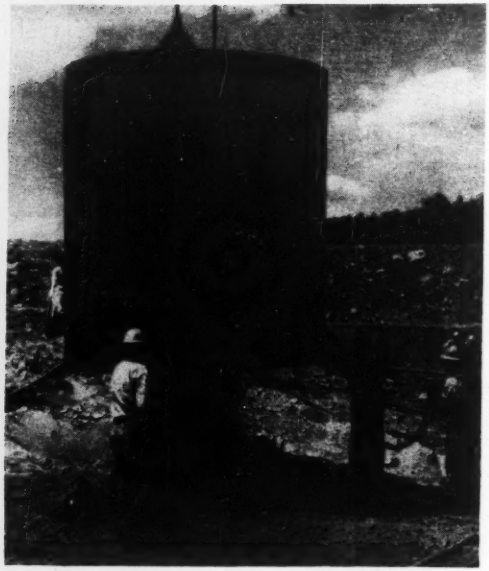
Aggregates are hauled by a fleet of ten 12-cu. yd. trucks from the gravel plant to stockpiles adjacent to the concrete plant, where sufficient material is kept stored for 3,000 cu. yd. of concrete. There are five of these stockpiles—one for sand and one each for the four sizes of gravel. Each is served by an unloading ramp built out over the stockpile.

A 9x8x300-ft. concrete tunnel extends under all five stockpiles. Superimposed on the tunnel and discharging into it are steel bins enclosing the base of the stockpiles. The bins are in the form of a truncated pyramid, 12 ft. high, 20 ft. sq. at the top and 2 ft. sq. at the bottom. Each size of gravel has two such bins and the sand stockpile has four.

Aggregates are conveyed from the stockpiles into the batching plant by three endless belt conveyors. The first one, operating in the concrete tunnel, receives material through air-operated sliding gates at the bottom of the aggregate bins. It deposits the aggregates onto a second belt conveyor which feeds onto the third conveyor, involving two right-angle transfers.

This third conveyor, operating on three 90-ft. box trusses and 60 ft. of timber trestle, elevates the aggregates to the concrete batching plant. A pivoted distributor, or turn-head, de-





CONCRETE PLANT (at left) includes a completely automatic batching plant, two 6-cu. yd. tilting mixers originally used at Boulder Dam and a 4,750-bbl. cement silo. Special twin-compartment 8-cu. yd. bucket (at right) places concrete in the forms from a 1,662-ft. cableway spanning the damsite. (Right Photo by Corps of Engineers.)

livers the material into the various batching bins above the concrete mixers.

Handling the cement

Cement is delivered by rail in steel hopper cars from a commercial cement plant at Okay, Ark. 20 mi. to an unloading station at Murfreesboro. It is discharged by screw conveyor from the cars into a 60-bbl. hopper, from where it flows into watertight cement trucks for transfer to the damsite.

The cement is discharged into a 60-bbl. hooded steel hopper at the damsite. A screw conveyor supported on a 36-ft. timber trestle delivers the cement from the hopper to a cased bucket elevator standing between the silo and teh concrete mixing plant.

Cement from the elevator is charged either directly into the cement compartment of the batching plant or into the storage silo, both of which are equipped with low-pressure aeration nozzles. Cement is reclaimed from the silo by a rotary feeder on the screw conveyor used for the original delivery.

Maximum permissible temperature of the concrete placed in the forms is 60 deg. F. This called for a complete refrigeration system for cooling both water and gravel, plus the addition of ice crystals directly to the mix during hot weather. All concreting was done at night during hot weather, starting at 4:30 p. m. and continuing through two 8-hr. shifts.

A direct-expansion ammonia refrigeration system was set up just below the mixing plant, complete with refrigerant compressors, water cooling tank containing the ammonia coils, condensers and induced draft cooling tower, and two machines for making ice.

One compressor runs both ice machines, with the ice crystals being pumped through a 2½-in. slush-ice line direct to the concrete mixing plant. The other compressor operates the refrigeration plant which furnishes water at 33 deg. F. through an 8-in. line to cool the gravel. Each machine can make 40 lb. of ice per min. Maximum charge of ice during the hottest weather last summer was 90 lb. per cu. yd. of concrete.

Cooling the gravel

Although the 9x8x300-ft. concrete tunnel under the stockpiles is primarily an aggregate tunnel, it also houses the 8-in. header line for cooling the gravel. Cold water from the header is introduced into the bottom of the gravel bins through 4-in. valved risers. It flows up through the material to a launder mounted around the top periphery of each bin.

Four-inch return lines in the corner of each bin, return the circulating water from the launders to a wooden flume along the bottom of the concrete tunnel. This flume carries the water to the upper end of the stockpile tunnel, discharging it into a silt trap and catch basin. The water then returns through a 10-in. pipe, insulated with sawdust concrete, to the chilled water storage tank for re-cooling in the raceway coils.

The gravel stockpiles also are sprinkled with ice water from jets mounted above the unloading platforms, during extremely hot weather. The sand stockpile, which cannot be cooled by refrigeration since it would retain too much water, is protected by a 100x75-ft. aluminum sunshade.

Automatic batching plant

All equipment in the concrete batching and mixing plant, except two 4-cu. yd. stationary tilting mixers, was bought new for the job. The mixers were used originally on Boulder Dam. They are mounted back to back on a concrete platform which also supports the batching bins and weighing equipment directly above the mixers. The plant is designed for automatic operation, with a rated output of 100 cu. yd. of concrete per hour.

The first concrete was placed last

June 1, and the best day's pour to date is 1,350 cu. yd. in two 8-hr. shifts. The dam is expected to be topped-off late this summer.

The batching plant has five compartments for a total of 400 cu. yd. of aggregate, plus a 500-bbl. cement bin. Each compartment and the cement bin has it own automatic batcher. They are interconnected with electric weighing devices and electrically controlled air valves to a central weighing and control board. The proportions of each batch are recorded on automatic recorder paper.

Sand and water scales are coordinated to compensate for moisture in the sand. This compensating device takes account of the water in the batched sand and eliminates an appropriate amount of water from the water batcher, all by a single adjustment. At the same time it indicates on the recording tape the dry weight of sand, as well as the true weight of both combined and free water.

The plant also is equipped with an air entraining admixture reservoir and batcher, and a batcher for ice crystals. Tilting and dumping of the mixers is by compressed air, actuated by an electrically controlled solenoid valve.

Concrete from the mixers discharges into two 6-cu. yd. hoppers from where it flows into dual compartment buckets built especially for the job. An electrically operated transfer car, with pockets for two buckets, operates on a standard gage track to transport the filled buckets into the proper position under the cableway for placement in the forms.

Twin-compartment concrete buckets

There are three special concrete buckets on the job, one of which is for standby. Each bucket has two 4-cu. yd. compartments housed inside a heavy cylindrical steel shell. They are bottom-dump, with gates operated by an air cylinder. The compartments can be dumped individually or simultaneously by connecting an air line in the forms, to the actuating mechanism in the bucket. The bucket is 9 ft. 8 in. high, and 8 ft. 9 in. in diameter. Concrete compartments have 40x30-in. gate openings at 4-ft. centers.

Concrete is deposited in the forms from a 1,662-ft. cableway spanning between a 90-ft. stationary headtower on the right bank and a 110-ft. traveling tailtower on the left bank. The dam is being built in 25 monoliths, from 27½ to 55 ft. wide. Forms are the conventional cantilever type, 40-ft. long and made up of 2x10-in. timber studs, lagged with 1¼-in. tongue-and-groove sheathing.

The forms are lined with ⅛-in. absorptive liner. All concrete is vibrated and water-cured. Mixing and curing water is pumped from the river, settled and chlorinated. Drinking water is hauled into the job.

Men in charge

Contractors on construction of the Narrows Dam and power plant are the Arundel Corporation of Baltimore, Md., and the L. E. Dixon Co. of San Gabriel, Calif., joint-venturers. C. L. Coray is project manager and L. P. Sowles, chief engineer. J. G. Shotwell, Tacoma, Wash., produced the aggregates under a subcontract. Construction of the project is under the immediate supervision of Col. R. G. Lovett, district engineer, Vicksburg District, reporting to the division engineer, Lower Mississippi Valley Division, Corps of Engineers. R. C. Baker is chief of the construction division, Vicksburg District, and J. C. Shewmake is resident engineer in charge of the project.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York

Performance Under Difficulties

Performance of a contract is not excused because subsequent conditions render its performance exceedingly difficult. Many court decisions, a few of which are summarized here support this view.

The contract establishes and determines the rights and obligations of the parties. Their agreements create obligations they are bound to fulfill and the court to enforce.

It is a well settled rule of law that a party must fulfill his contractural obligations. Fraud or mutual mistake, or the fraud of one party and mistake of the other may relieve from an expressed agreement. An act of God or the law or the interfering or preventive act of the other party may free one from performance; but, if what is agreed to be done is possible and lawful, the obligation of performance must be met.

Difficulty or improbability of accomplishing the stipulated undertaking will not avail the obligor. It must be shown that the thing cannot by any means be effected. Nothing short of this will excuse non-performance. The courts will not consider the hardship or loss to one party or the meagreness or uselessness of the result to the other. They will neither make nor modify the contracts nor dispense with their performance. When a party by his own contract creates a duty or charge upon himself, he is bound to a possible performance of it, because he promised it and did not shield himself by proper conditions.

There are cases in which this principle is not applied, including executory contracts for personal services or the use of particular buildings. There is an implied condition that if the person or thing shall not be in existence at the time stipulated for performance; it shall not be required. And, in every contract there is an implied undertaking on the part of each party that he will not intentionally do anything to prevent the other party from carrying out the agreement.[1]

The general rule is that parties who, by their own contract and positive undertaking, create a duty or charge upon themselves must abide by the contract and make the promise good. Subsequent contingencies not provided against in the contract, even such as render performance impossible, do not bring the contract to an end.[2]

No matter how harsh and apparently unjust in its operation such a rule may occasionally be, it cannot be denied that it has its foundations in good sense and inflexible honesty. He that agrees to do an act should do it, unless absolutely impossible. He should provide against contingencies in his contract. Where one of two innocent persons must sustain a loss, the law leaves it where the agreement of the parties has put it. The law will not insert an exception which the parties have not, either by design or neglect, inserted in their agreement.[3]

As a general rule performance of a contract is not excused because of impossibility of performance due to war conditions.[4]

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(1) Cameron-Hawn Realty Co. v. City of Albany, 207 NY. 377.
(2) Leonard v. Autocar Sales & Service Co., 64 N.E. (2nd) 477.
(3) Schwartz v. Hoffman Foundation & Holding Corp., 51 A. 2nd, 240.
(4) Freeto v. State Highway Commission, 166 P. 2nd, 728.

Five towns saw these machines come and go as . . .

Portable Plant Coats Pipe For Fast-Moving Project

A PIPE LAYING SCHEDULE calling for 255 mi. in six months, placed heavy responsibility on the subcontractor who had to coat nearly 35,000 lengths of 8-in. steel pipe and deliver them alongside the trench. The project is Socony-Vacuum's new oil products line between Malvern, Pa. and Binghamton, N. Y.

Departing from the bee-line only where easements were not available, the line's 35-ft. right-of-way rises and dips across the pronounced northeast-southwest Appalachian ridges of eastern Pennsylvania (see map). Spurs of 6-in. pipe were also built to lead to bulk plants at Reading, Allentown, Hazleton and Exeter.

Construction began in June, 1948, and ended in December, right on schedule. One gang worked northward during the entire six months, and a second gang started southward from Binghamton in September. The two met near Scranton.

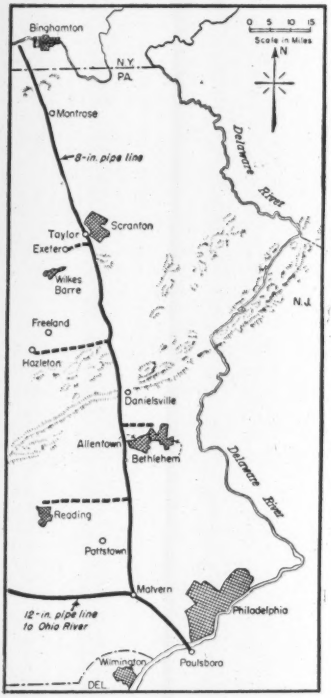
Trenching, laying electric-welded pipe, and backfilling were the simple operations along the location.

The principal construction problem, however, was to deliver the pipe lengths with their fragile bituminous mastic coatings, to the right-of-way in sound condition and on time. The solution rested upon two requirements: haul-roads over which pipe trucks could be driven safely from the public highways to the site; and a pipe-coating plant of adequate capacity located near enough to the site to allow a reasonably short haul.

In most cases right-of-way clearance provided haul-roads that were sufficiently smooth to prevent pipe damage, but compliance with the second requirement was not so easy. Because the job moved fast, and from both ends during the second three months, a plant that was well situated one month would have been too far away the next month.

The coating plant

A portable pipe-coating plant was the answer. Under a subcontract the plant was established first at Pottstown, well ahead of the starting point; then it was moved successively to Danielsville, Freeland, Taylor and Montrose. At Taylor the plant was in advance of northbound pipe laying, and in position to begin serving south-



STRIP MAP OF PIPELINE from Malvern, Pa. to Binghamton, N. Y. Oil products move northward from previously-built 12-in. line, which connects refinery at Paulsboro, N. J. with bulk plant at Midland, Pa. Dotted lines are 6-in. feeders for larger cities.

bound operations. Movement of major plant items was by rail.

Pipe-coating steps were, successively: pipe-cleaning, heating and priming; coating and whitewashing; and cooling.

Raw 8-in. seamless pipe in 40-ft. lengths was supplied to the subcontractor, who stockpiled it. From the stockpile the pipe was hoisted onto a skidway, from which it was fed longitudinally, one length at a time at 25 ft. per min. through a "rotablast," an oil-fired furnace, and a bituminous pressure-spray. In the "rotablast," steel grit was shot against the pipe to clean it. When the pipe emerged from the furnace for spraying, its temperature was 140-160 deg. F.

Primed pipe lengths were pushed sideways onto a second skidway that led to the coating assembly.

This element consisted of an asphalt mixing unit and a feed-and-coat unit. The mixing plant, delivering about 12 tons per hour, was designed to handle a mix of 87 percent (by weight) sand, limestone and asbestos fiber, and 13 percent asphalt of 21-25 penetration.

The mix was delivered at 350 deg. F. by hopper to a screw pump that forced the mix into a coating chamber, part of the feed-and-coat unit.

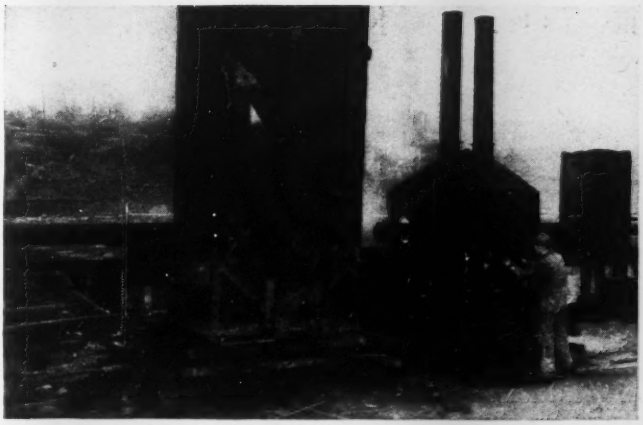
The heart of the plant

Schematically, the coating chamber was a short cylinder of about 2-ft. diameter and 2-ft. depth, standing on its side with the screw-pump mounted tangentially on top. One end of the cylinder had a centric hole of uncoated-pipe size; the other end had a centric hole ½ in. larger than the pipe.

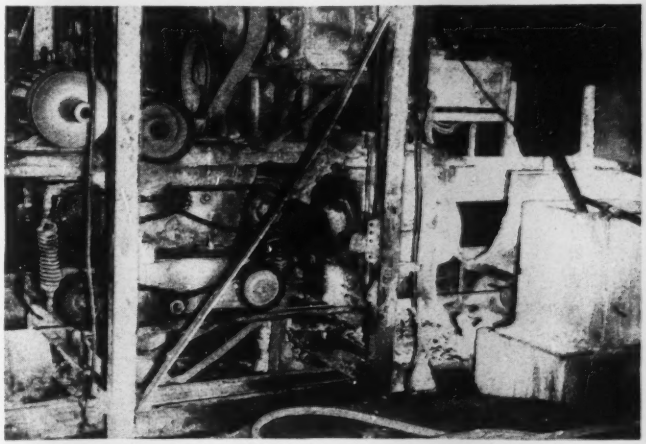
The other part of the feed-and-coat unit was a pipe-feeder (see illustration). The rate of pipe-feed was synchronized mechanically with the rate of mix-feed, so that the correct amount of mix was deposited on the pipe as it traveled through the chamber.

At the plant, primed pipes were drawn lengthwise from the lower end of the second skidway, through the feed-and-coat unit. The mix extruded with the pipe as the pipe emerged from the larger hole. After leaving the annular space of extrusion (¼-in. thick) the coating expanded to ⅜-½-in. thickness. Ten inches at each end of a length were left bare to provide working space for welding. The final application was a spray of whitewash, said to reduce cooling time from three hours to less than an hour.

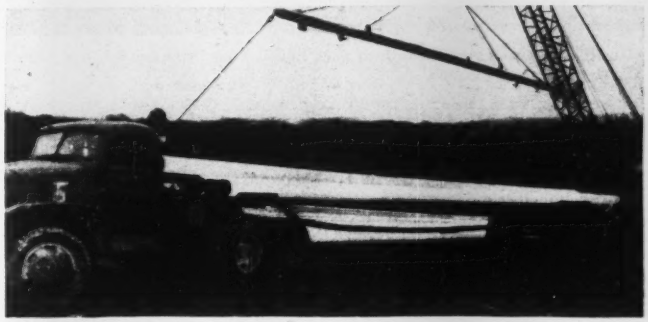
Pipe alignment during coating was maintained by a track-mounted dolly that caught the emerging end and traveled with it. The completely coated pipe was picked up by a crane,



RAW PIPE was fed from the left, through a steel-grit blaster, oil-fired preheater (two stacks) and a bitumen pressure-sprayer.



FEED-AND-COAT UNIT. Sprocket-chains powered feed gears, which drove pipe through coating chamber and whitewash spray.



LOADING PIPE-TRUCKS. The crane spreader-bar reduced eccentric stresses on the pipes during hoisting to truck-trailers.

BULLDOZING 35-FT. RIGHT-OF-WAY in rugged Pennsylvania country. Cleared strips became haul roads for pipeline construction.

HAUL ROADS were smooth enough to allow truck-delivery of undamaged pipe, direct to trench for ready installation.

and transferred to the cooling yard, where the pipe was tested for coating defects with an electrical detector consisting of a power box and a metallic "whisker" ring that fitted around the pipe. As the ring was drawn along the pipe, the device emitted a signal whose tone altered when a change in density was passed. Later, another crane either moved the pipe to a stockpile, or loaded it onto a truck for transportation to the trench.

The pipe trucks, owned by the coating subcontractor, were semi-trailers with long booms connecting the trailing wheels with the tractor fifth-wheel. Horizontal platforms, corrugated to accommodate the pipe, were mounted over trailing wheels and over the tractor power-wheels.

Pipes were loaded in a single layer, eight to a truck, and dispatched to the cleared and rough-graded construction line. In all but a few inaccessible or impassable spots, pipes were unloaded within a few feet of their final resting place. Crawler-tractor side-cranes, equipped with canvas slings, performed the unloading.

The final pipe-coating operation—covering the joints—took place after welders had joined the lengths. A hinged split-mold somewhat longer than the 20-in. bare stretch of pipe at the joint, was filled with mastic and compressed hydraulically. The mold was handled by a tractor side-crane. One crew could coat 200 joints in a day.

Work along the location

Typically, the line was laid 2 ft. under the surface, although where topographic breaks were sharp the pipe frequently was placed deeper. River crossings were made in trenches excavated 4 ft. below the streambed, and passages through highway and railway embankments generally were run through 12-in. spiral-welded steel pipe, at depths specified by the road or rail authorities.

Construction procedure consisted of clearing overburden and vegetation from the right-of-way, trenching, installing pipe and backfilling. Pipe lengths were laid on lagging over the trench, clamped for line-up and electric-welded by men working in pairs. After joint-covering and a final inspection for breaks in the coating, long sections of the finished pipe were lowered into the trench. Connections through embankments, and some river crossings, were made after cross-country sections were in place.

Bulldozers did most of the clearing and backfilling, and backhoes dug the trench wherever possible. In rock, the trench was shot out with dynamite, loaded in holes drilled about a foot deeper than desired depth and spaced 3 ft. apart. Thirty to 35 holes were fired at a time.

Major plant equipment for one crew of 150 men (one heading) included six bulldozers, three tractors with side-cranes, six backhoes, four compressors and eight welding machines.

Project direction

The coating subcontractor was H. C. Price Co., Bartlesville, Okla. The Price company designed and built most of the plant items for the coating procedure, which is called the "Somastic Process." Hugh Clements was plant superintendent for Price. The prime contractor was Midwest Constructors, of Tulsa, Okla.

Under George Brigance, of the Socony-Vacuum eastern pipeline division, Templeton Blair was resident engineer on the northbound line and Walter Lewis was resident engineer on the southbound work.

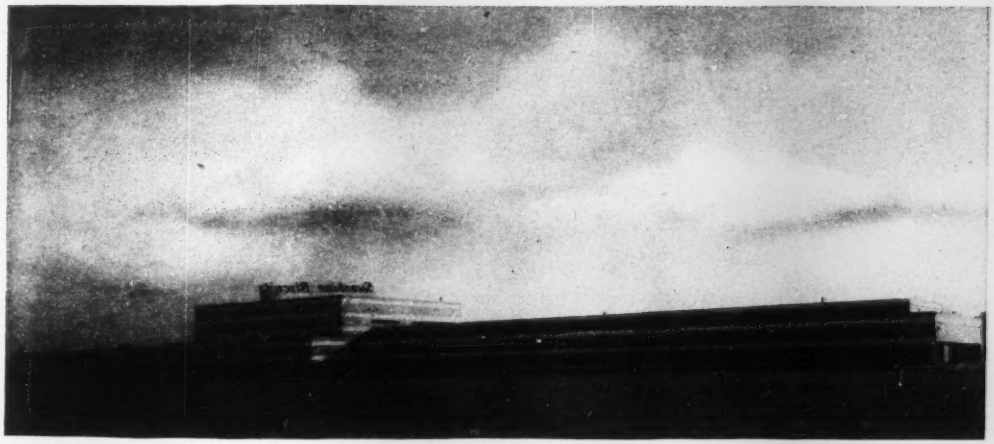


Fig. 1. SUNSHINE BISCUITS FACTORY rests on a foundation designed as an inverted reinforced concrete flat slab.

Multistory Factory Floats on Gumbo

WHEN BEARING TESTS indicated that the soil at the site of a new factory in Kansas City, Kan., could take only light pressures, the structural steel frame was set on an inverted, reinforced concrete, flat-slab foundation. In effect, the building, which ranges up to five stories in height and incorporates the world's largest ovens, floats on the soil.

Built for Sunshine Biscuits, Inc., this bakery and candy manufacturing plant is 1,200 ft. long. It is composed of a 220-ft. square, five-story center section, a three-story, 520-ft. long wing on one side and a two-story, 460-ft. long wing on the other. Floor area totals 800,000 sq. ft.

The factory is located in the Fairfax district, an industrial section of the city. Here, overlying fine sand, the soil down to about 16 ft. is gumbo—an alluvial deposit of fine clay, silt and sand that cracks when dried out. The building foundation, about 4 ft. below natural grade, was, therefore, designed to rest on the gumbo.

Tests show low bearing strength

Bearing tests were made on a 1-ft. square plate with 8,000 and 4,000-lb. loads. The heavier load produced ⅝-in. settlement. With the lighter one, there was no movement in a week, following an initial settlement of 3/16 in. Previously, many bearing tests had been made in the same industrial district, with the result that it is customary to use 2,000 to 2,500-psf. pressures in the design of foundations.

Steel grillages replace drop panels

To eliminate the expense of the many large-size, independent footings that would be required by such low bearing values and a column spacing of 20 ft. in two directions, the foundation for the Sunshine plant was designed as an inverted, two-way flat slab of 3,000-psi. concrete. But the drop panels and column capitals usually used with flat slabs were omitted. Instead, steel grillage systems were embedded in the slab under the interior columns to transmit the column loads to the slab. These loads may run as high as 735,000 lb.

Under full load, the average pressure on the soil under the five-story portion of the building is 1,600 psf., under the three-story wing 1,010 psf. and under the two-story wing 770 psf. Maximum pressures occur under the deepest foundations, which are in the elevator pits 6 ft. below the basement floor. Here, the pit walls were designed as beams spanning between the columns, as required in ordinary flat-slab construction, and the maximum soil pressure under a five-story elevator is 1,955 psf.

The grillages consist of two perpendicular pairs of 4-ft. 6-in. long structural steel channels (Fig. 3). Before the slab was cast, each grillage was supported, near the ends, on 1-ft. 10-in. long, 2½x2½x¼-in. angles, bolted to a 4-ft. 6-in. square, 2½-in. thick concrete pad. A space was left between the channels for insertion of a column stub of the same dimensions as the building column to be supported (Fig. 2). The stubs were welded to the channels because riveting would have required plates protruding above the foundation slab, which also serves as the basement floor.

The grillages were completely incased in the foundation slab. Thus, the depth of the channels determined the thickness of the mat. Where diagonal tension exceeded the allowable stress in the concrete, continuous U-type stirrups were placed across the ends of the channels.

Slab thickness and depth of grillage channels are, respectively, 16¼ in. and 10 in. in the two-story wing, 18¼ in. and 12 in. in the three-story wing, and 21¼ in. and 15 in. in the five-story portion. A ¾-in. topping was bonded to the upper surface of the mat for a basement floor.

Advantages of the design

Use of the grillages is estimated to have saved about 6 in. in overall slab thickness—or in thickening of the concrete under the columns—as compared with grillages made up of two or more layers of reinforcing steel. Base plates, which would have been as large as 30 in. square, were eliminated.

Other advantages claimed by the de-

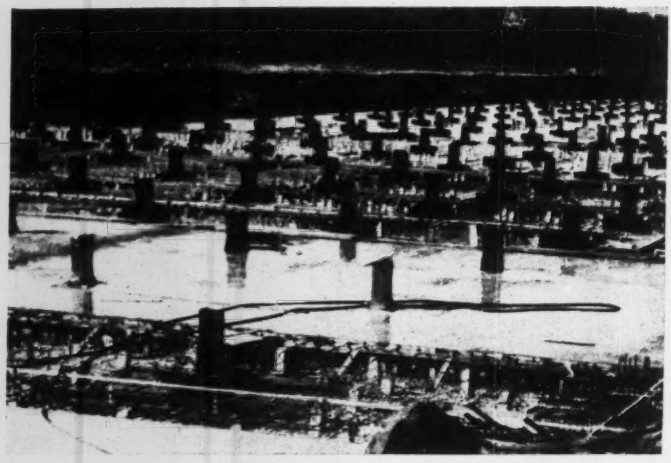


Fig. 2. STEEL GRILLAGES were embedded in the foundations to transmit column loads to the slab. Building columns were erected on column stubs welded to the grillages.

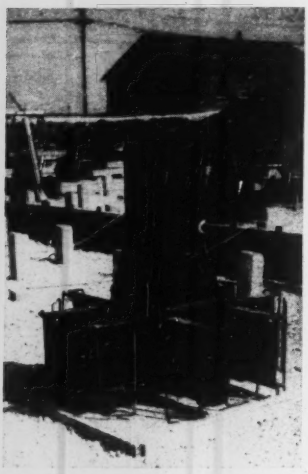


Fig. 3. STIRRUPS augmented the grillages when diagonal tension was excessive.

signers for this construction include those accruing from constant thickness of foundation and a more uniform distribution of superimposed loads. Excavation (45,000 cu. yd.) with tractor-drawn scrapers was facilitated. Furthermore, during the early construction stages, a minimum of structural steel was required for the foundation slab and walls—an important consideration when structural steel is in short supply.

Concrete made with low-alkali content, type II cement, to reduce shrinkage in the mat, was poured in alternate bays across the width of the building, and the intervening bays were subsequently cast after an initial shrinkage was obtained. The construction joints contain an elastic, waterproof membrane as a seal, located at mid-depth of the mat. Because of the thickness of the slab, it is believed that any slight settlement will not permit water to seep into the basement, since either the top or the bottom of the slab will be in compression.

Drains remove subsurface water

To reduce hydrostatic pressure head under the mat, a minimum of 6 in. of crushed stone was placed over the entire basement area, and a drainage system with 6-in. perforated, asphalt-coated, corrugated metal pipe was installed entirely around the building. Cross laterals, with a pitch of 9 in. in 160 ft., were spaced about 200 ft. apart. Four automatically operated 200-gpm. sump pumps eject the underground water to the Fairfax district storm drainage system.

The crushed stone made an excellent working floor. It provided at all times a dry, stable surface on which to place reinforcing steel, grillages and concrete.

To insure water tightness of the concrete foundation walls, the exterior surface of the walls was sprayed with a coal-tar primer, and then a two-ply 11-oz. cloth membrane was applied with pitch. The primer lays dust and provides a bonding base for the membrane. Since the soil does not contain gravel, a cement-plaster coat was not deemed necessary for protection of the waterproofing from the backfill.

Complete architectural and engineering requirements of this project were prepared by the engineering division of the General Manufacturing Department of Sunshine Biscuits, Inc., under the direct supervision of M. C. Haley, chief architect and engineer. Walter H. Wheeler, consulting engineer of Minneapolis, Minn., collaborated on the design of the mat foundation and grillage systems, for which he holds a patent. Swenson Construction Co., Kansas City, Mo., was the general contractor, and Gage Structural Steel Co., Chicago, erected the structural steel.

City-Manager Plan Shows Steady Growth

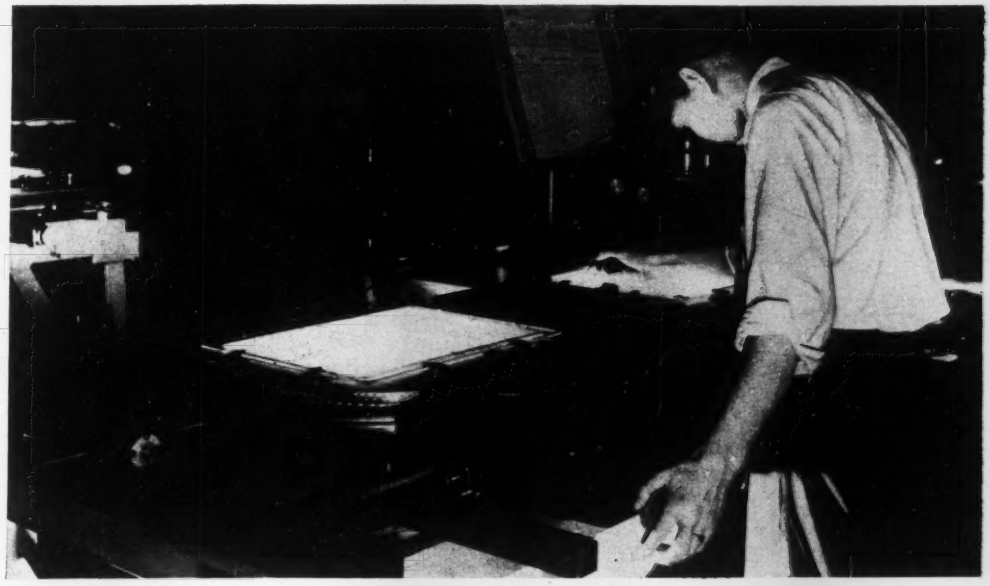
Sixty-eight cities and four counties adopted the council-manager plan of government in 1948 the International City Managers' Association reports.

This brings the total of towns, cities and counties under the plan to 876. The United States has 830 local governments under the plan. In addition, three cities in Alaska, one in Puerto Rico, 38 in Canada, and four in Ireland have this form of local government.

Adoption of the manager plan by four counties at the November elections raises to fifteen the number of counties under this plan. In Maryland, Montgomery (Rockville) and Anne Arundel (Annapolis) county voters approved adoption of the county-manager plan. Santa Clara (San Jose) county, California voters adopted a locally drafted charter for the manager plan while San Mateo (Redwood City) county, after electing its manager since 1937, will once again operate under a true county-manager plan.

Richmond, Va., with an estimated post-war population of 223,716 was the largest U. S. city to adopt the manager plan in 1948. Waco Tex., 55,982 and Meridian, Miss., 35,841 also were new additions to the list of cities with council-manager governments. Among others that adopted the manager plan during the year were 10 California cities, 9 in Texas, and 8 in Maine.

There has been an accelerated growth in adoptions of the manager plan since V-J day. Prior to 1940 the number of adoptions of the plan by cities and towns averaged less than sixteen per year. Since 1945 adoptions have averaged more than 76 per year with 229 towns, cities and counties choosing the council-manager plan of government in the past three years.



CONTOUR SKETCHING. The operator traces contours on a transparent overlay, in conformity with the stereoscopic model.

Cleveland Buys an Aerial Map

G. Brooks Earnest
Professor of Engineering Surveying,
Case Institute of Technology,
Cleveland, Ohio

At slightly less than half of ground-survey cost, and one-fiftieth of ground-survey time, Cleveland is getting an aerial topographic map that already is paying dividends in reduced project-planning costs.

The cost for 1,000 copies of the finished maps produced by the photogrammetric process is $3,200 per sq. mi., compared with $7,500 estimated for the plane table method, on the basis of experience in Cleveland. This is a maximum air-map cost for a minimum order; there is a sliding scale downward in cost per sq. mi. for increase in scope of area mapped.

There is a much greater proportionate saving in time. Once the area is flown and photographed the contractor can compile and deliver four sheets (2.88 sq. mi. including overlap) each week. This is at a rate 50 times that of the plane table mapping. In other words, Cuyahoga county (450 sq. mi.) can be mapped photogrammetrically in three years, whereas it would take 150 years by the plane table method with three mapping parties in the field.

After World War II, increased regional, county, municipal, and private project planning in metropolitan Cleveland required up-to-date topographic information in a hurry.

Existing aerial photos were of the vintage of about 1938, and available topographic maps covered scarcely one-seventh the area of Cuyahoga County. Most of these maps were on a scale of 1 in. equals 400 ft. with a 5-ft. contour interval, although about 16 sq. miles (in pencil) were to a scale of 1 in. equals 200 ft. (1:2400) with a 2 ft. contour interval.

Speedy satisfaction of the demand for maps could be realized only by photogrammetric methods, and the Cleveland Regional Geodetic Survey was authorized to procure aerial maps and photographs. The Survey, in addition to having established extensive controls in the county, had by plane-table methods prepared the 1 in. equals 200 ft. maps mentioned above for preliminary location and line design on the Cleveland freeway. As an initial step toward a complete county topographic map, the survey prepared specifications for aerial photographs of the whole county, and for eight test map sheets, to cover a small area near the plane-table work.

Aerial mapping specifications conform to those adopted for the plane-table mapping, which in turn conform to those recommended in Manual No. 10, ASCE "Technical Procedure for City Surveys." The aerial photography covers 450 sq. miles. The specifications require that:

Specifications for aerial maps

"The scale of the finished map sheet shall be 1 in. equals 200 ft. Each sheet shall have a map area of 5,000 ft. east and west by 4,000 ft. north and south and an overall sheet size of 24 in. by 31 in. The sheets shall be based on the established plane rectangular coordinate system. Ticks (small coordinated crosses) for the State Grid shall be placed adjacent to the corners.

"Each sheet shall show the 1,000-ft. map grid lines plotted within 1/200 in. of their computed distances. All control points plotted thereon shall be located within 1/100 in. of their respective coordinate positions.

"The contour interval of the map shall be 2 ft. with each line repre-

FULL-SIZE SAMPLE of Cleveland's 1-in. = 200 ft. aerial topographic map. Note bench mark, for ground control, upper left.

senting the 10-ft. intervals accentuated. Spot elevations shall be shown on all prominent saddles, peaks and depressions.

"Ninety percent of all contours shall be plotted within one-half contour interval of correct position and no contour shall be more than one contour interval from correct position, except if it can be brought within the vertical tolerance by shifting its plotted position by 1/50 in.

All details required

"The map shall show all streets, railroads, buildings, churches, schools, industrial sites, and works of man. Ninety percent of all well defined planimetric features shall be plotted within 1/50 in. of their true positions. No point shall be misplaced by more than 1/25 in.

"All drainage shall be plotted within 1/25 in. of its true position. All wooded areas representing an area larger than ¼ acre shall be shown and all woodlines which are well defined shall be plotted within 1/25 in. of their true locations. Clearings, 15 ft. or more in width cut through woods, shall be shown.

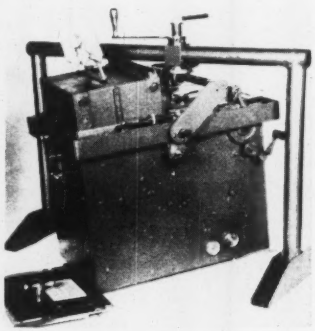
"The negative scale shall be 1 in. equals 400 ft. with a minimum effective image area of 48 sq. in. Negatives showing a departure from this scale by more than ± 5 per cent in excess of that caused by variations in relief will be rejected.

"The overlap in the line of flight shall average 56 percent and any overlap less than 52 percent along the entire edge of the aerial photo will be rejected. The sidelap on the negatives shall average 20 percent and any sidelap less than 10 percent will be rejected.

"Any series of two or more consecutive photographs crabbed in excess of 10 deg. as measured from the line of flight may be considered as cause for rejection.

"Tilt shall in no case exceed 2 deg. and shall not average more than 1 deg. in any one flight line, nor more than 40 min. for the entire area.

"One-thousand copies of the map sheet shall be delivered in four colors; planimetry in black, contours, contour numbers, and spot elevations in brown, woodlands in green, and drainage in blue for all open bodies of water or streams represented by a double line. The lithographic map reproduction shall be on 50 percent rag stock 50-lb. paper.



AERIAL CAMERA used in the Cleveland mapping project. Glass plate negatives assure maximum dimensional stability and accuracy.

A contract was let for 450 sq. mi. of photographs and for the test maps. Four test maps were completed in advance-sheet form, for checking, within 60 days after flying. One thousand reproduced copies of the map were shipped to the contracting officer within 30 days after approval for accuracy.

The checking of 26.29 mi. of field profiles against the profiles produced from the photogrammetric process resulted in 95.4 percent within one-half contour interval. None of the remaining 4.6 percent exceeded a contour interval. All planimetry, drainage, and woodlines along these profiles checked within the specifications noted previously.

Ground control

Over 1,500 precast concrete monuments have been set within the past ten years for the physical establishment of the horizontal and vertical control. A 3-ft. diameter circle was painted around those monuments and bench marks set in paved areas, to assist in easy identification thereof for (1) scale checking, and (2) coordinate and elevation control in the operation of the stereocomparator. Four-ft. square corrugated carboard targets (with a 3-ft. diameter circle in white) were placed over all monuments set in unpaved areas to insure visibility by the flying camera.

The Cleveland Regional Geodetic Survey began operations July 12, 1937. The final triangulation network embraces 133 stations. The average area controlled per station in urban territory is 2.5 sq. mi. and that in rural territory is 4.0 sq. mi. The triangula-

tion observing is about 95 percent completed.

There are seven base lines in the net ranging from 1.51 mi. to 3.68 mi. in length. The average probable error for the measurements thereof is 1 part in 2,175,000 with a maximum of 1 part in 1,523,000. The average base to base discrepancy after the side and angle equations were satisfied, was 1 part in 104,000 excluding one phenomenal discrepancy of 1 part in 8,881,000.

Traverse supplements the triangulation control to provide a multiplicity of survey points within the county. The total length of first and second-order traverse projected for the county approximates 1,200 miles. It is about 60 percent completed. An average of 21 percent retakes on angle and taping operations has been necessary to bring position cloures within specifications.

The vertical control network, completed in June 1946, comprises a total of 1,490 mi. It includes 584 mi. of first-order levels and 719 mi. of second-order levels. An additional 111 mi. of first-order levels and 76 mi. of second-order levels were rerun to meet specifications.

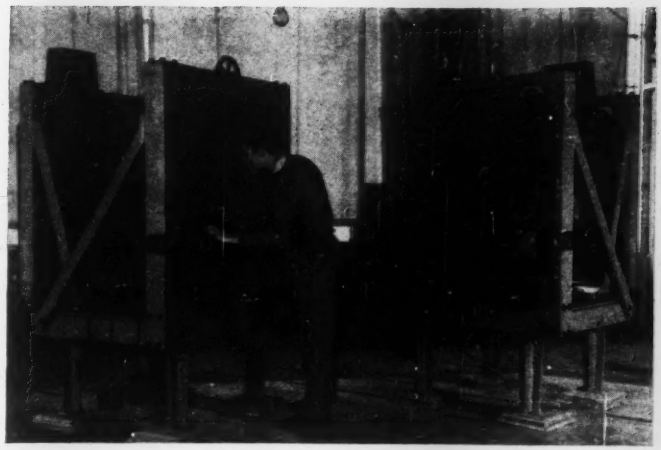
Over 3,000 bench marks have been established along the level lines, providing elevation data within about one-half mile of any point in the county.

Practical results

Descriptions and elevations of about 1,000 monuments were published in 1941 in Report No. Two of the Cleveland Regional Geodetic Survey. Additional survey data in the form of descriptions, coordinates, and elevations obtained since 1941 have been available at the survey headquarters. Typed information is submitted upon request. The office averages about 150 calls a month for survey data.

A final publication which divides the county into sections 20,000 ft. in the east-west direction, by 28,000 ft. in the north-south direction is being processed. A line map to a scale of 1 in. equals 3,000 ft. showing all control for each section accompanies the multilithed survey data for all points and lines within that section, thereby making it convenient for any survey or to locate required starting points on the map and to obtain the desired survey data.

One of the greatest benefits already realized from the control and mapping is the expedition of the freeway program. The photography and mapping permit centerline location and preliminary line design suitable for preliminary estimates, thereby saving many hours of time in field location. One prominent freeway planner said, "If the existing topographic maps had been available in 1942 we would have saved at least two years in the freeway programming and construction projects now under way."



CORRECTION PROJECTOR enables mapping contractor to correct any tilt in original aerial negatives.

Both public and private agencies within metropolitan Cleveland are making wholesale use of the coordinate control data and the level data. Convenient positive checks on field observations constitute a natural benefit in saving of time and money.

The many inquiries concerning availability of horizontal and vertical control data and topographic mapped areas are testimony to the benefits foreseen. Cleveland, being a large industrial center, prompts requests by a number of these industries relative to mapping regions adjacent to existing plants for the study of the expansion thereof.

The recently organized Cleveland Regional Planning Commission will tackle problems relating to both sanitary and storm sewerage distribution, freeways, parking, traffic distribution, rapid transit location, zoning, and other related planning for which the aerial photos and the topographic mapping will be indispensable.

Both the Cleveland Regional Geodetic Survey and the aerial mapping are sponsored projects, the City of Cleveland, County of Cuyahoga, and Ohio Department of Highways being the three main sponsors. The writer is consulting director for the sponsors. The contract price for the aerial mapping is $41,000, each of the main sponsors contributing one-third. This includes photographing approximately 450 sq. mi. on glass plate negatives and the furnishing of 1,000 copies of each of eight map sheets to the prescribed specifications.

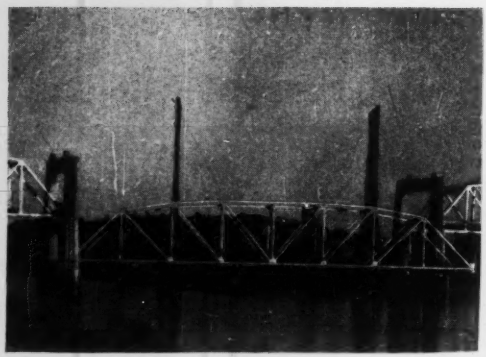
The Aero Service Corp., Philadelphia, is performing the contract for the photogrammetric work.. Compilation of these topographic sheets was accomplished through the Brock Photogrammetric Process, which uses glass plate photographs for the high accuracy which is needed. These plates are rectified to eliminate air tilt and the two-foot contours are drawn on the rectified plates which form the stereoscopic model. This method which is of American design, has been used for many types of engineering mapping requirements in recent years.

Four hearings finished On Army's 308 Report

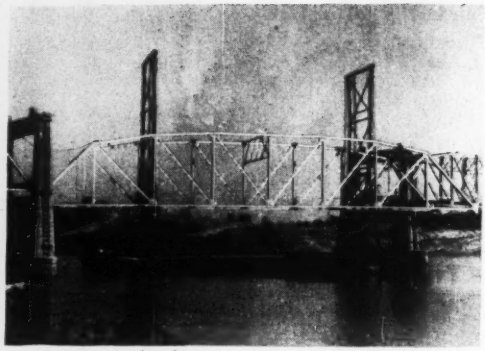
The last of a series of four public hearings in the Northwest on the proposed long-range program for development of the Columbia River basin's water resources was conducted in Boise, Ida., Feb. 4 by the Board of Engineers for Rivers and Harbors.

A decision will be announced by the board after it returns to Washington, D. C. (ENR Jan 27, p. 19).

The plan, outlined in the socalled "308" Report of the Corps of Engineers, would provide for an elaborate system of multi-purpose projects designed to provide for new power, flood control and reclamation. The board will determine whether the plan will be pushed, dropped or modified.



BARGE IS SECURED prior to lifting operation in which . . .



168-FT. TRUSS goes aloft on timber bents.

Three-Span Steel Highway Bridge Moved 20 Miles Downstream

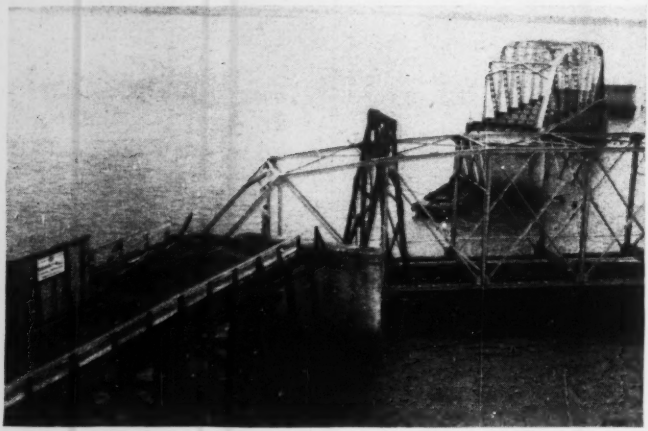
CONSTRUCTION know-how made a relatively simple job of a tricky 20-mile relocation and re-use of steel highway bridge trusses.

Three through trusses, two of 150-ft. span and one of 168-ft. were lifted from their piers in Lake Marion on the Santee River, S. C., towed downstream on a 135-ft. wooden barge and placed on newly constructed piers crossing the Santee-Cooper diversion channel.

Outstanding for its simplicity, the lifting and replacing method required only a wooden barge, hand-operated machinery—and considerable ingenuity.

The relocated bridge originally carried Route 15 across the Santee River at a point due east of Orangeburg. This crossing was put out of service when Santee Dam was completed in 1941 to form Santee Reservoir—later named Lake Marion.

Now the reclaimed structure will carry Route 45 over the diversion channel which takes water from Lake Marion over into Lake Moultrie in the Cooper River valley. At their new site, the two 150-ft. sections are used as deck trusses, and the 168-ft. center section is a through truss affording 50 ft. clearance above the navigable channel.



ANCHORS AWEIGH—With the far span already removed and only the 168-ft. center span remaining in place at the Lake Marion site, the 150-ft. near-shore truss begins its 20-mile cruise downstream.

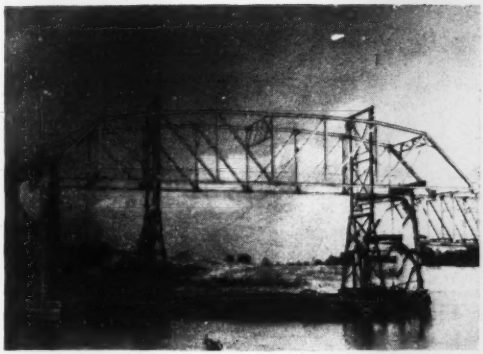
Foreman suggests plan

Many schemes for handling the trusses were studied by the South Carolina Highway Department and the contractor, Wanamaker and Wells, Inc., of Orangeburg.

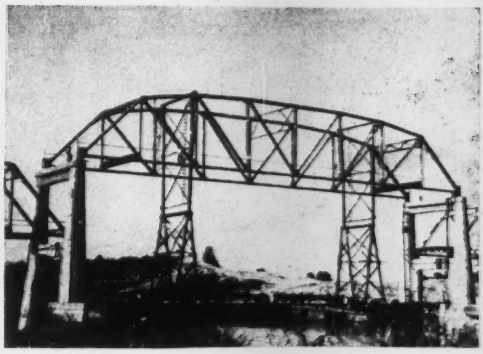
The plan finally adopted was proposed by the shop foreman for the contractor, Jerry Garret, who—after acceptance of his plan—was assigned the job of field organization and supervision of the truss-handling work.

At his suggestion for the dismantling two A-frame bents, several feet higher than the trusses, were erected on the barge. Built of 12 in. pine poles and capped by 10x10 in. timbers, each of these bents straddled floor beams at the second panel points of the truss. Hand operated block and cable rigs hung from both ends of the bent caps were attached to the floor beams of the truss to give four points of lift. The trusses were slowly lifted off their shoes at the rate of about 10 ft. per hour, and then after the barge was rotated, they were lowered to an I-beam grillage supported on the barge gunwales. The barge was closely controlled by guy lines fixed to the piers and taken up by four small hand winches, one at each corner of the barge.

Once the truss had been lowered



HOISTED 50-ft., the structure is raised slowly until . . .



BARGE ROTATES, putting truss into position.

to the barge deck, a towboat was attached, and the structure was towed downstream, taking seven hours for the 20-mi. journey.

At the new site the barge was held fast in a diagonal position while the truss was hoisted 26 ft. above the water level. Then the barge was rotated until the truss was properly positioned to be set down on its new seat.

Center span problem

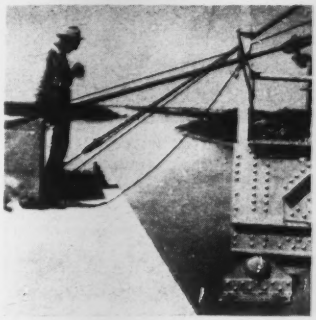
While removal and transportation of the 168 ft. truss for the center span was the same as that of the two shorter structures, the re-erection on the 50-ft.-high piers at mid-channel posed a more difficult problem. This was met by extending the basic scheme for lifting. Single plane bents were constructed on top of the A-frame bents; the combination bent then reached 80 ft. above the barge deck. Blocks were shifted to the upper caps, and the bents were guyed fore and aft. This time, the floor beams were removed and the points of lift were at the second panel points on the lower chord of the truss.

With rig thus made ready, the barge was towed into an angular position between the two mid-channel piers. When it was properly secured, two-man crews, alternating with two-man relief crews, went to work at the four hand winches. In addition to the 16 men operating the four main winches, another eight workmen were employed in the lifting operation. It required five hours to raise the truss slightly above pier elevation. The barge was then carefully maneuvered into position for lowering the truss onto the piers; close control was maintained at all times, and the truss was lowered into place.

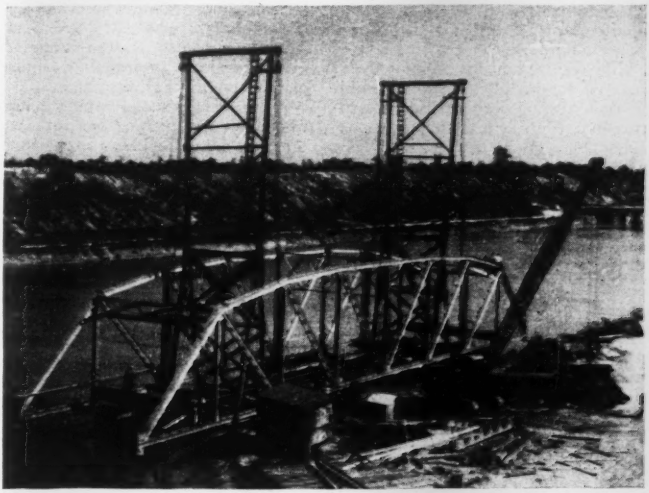
Decking will be built up on the top of the two 150 ft. spans and the original deck, slightly widened, will be used on the center 168 ft. span. A steel grating roadway will be used in order to reduce weight on the structure.

First stages of construction were shared by McMeekin Construction Co., of Cheraw, S. C., and Boyle Construction Co., Sumter, S. C. The former outfit completed all four river piers. The two mid-channel piers were supported on steel H-pile clusters driven 30 ft., and, more, into marl, and piers near shore were built on clusters of untreated timber piles. Boyle company placed the approach embankments as its part of the first construction stage.

The entire project was supervised for the highway department by Salvadore LaTorre.



JOURNEY'S END is but a few feet away as the barge begins to rotate, swinging the truss into position over its roller bearings.



BENT EXTENSIONS BUILT—At this point just downstream from the original site, single plane bents were built atop A-frames for hoisting the high center span.

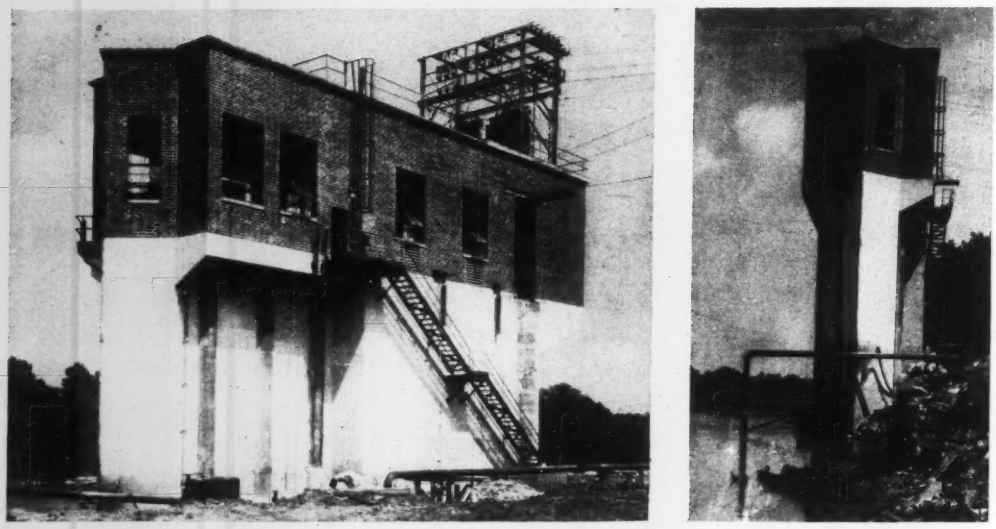


Fig. 1. NARROW WET PUMPHOUSE splits flood waters with "ship's prow" on upstream end Station is designed for 43.5-ft. river-level variation. Pumps are submerged below lowest stage. Transformers on roof add anti-buoyant weight.

How to Design River-Intake Pumphouses

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Celanese Corporation of America
New York, N. Y.

SUCCESSFUL river intakes and pumphouses must be designed to fit local water conditions.

Site, type and design of pumphouse, screens, pumps, piping, strainers, ventilation, heating, ice-formation prevention and controls are important considerations to be investigated fully and resolved economically when river supplies for industrial plants or municipalities are being developed.

These design considerations are of such importance that a point-by-point discussion is indicated.

Site facts

Frequently there is little choice in selecting a site for a river pumphouse. Riparian rights should always be checked to prevent future damage suits; often local or state permits are required before water may be taken from a stream.

There are obvious advantages in locating a pumphouse upstream from plant-effluent outfalls and on the inside of river bends where less debris accumulates than on opposite shore. At extreme low water, the level in an eddy, dammed by a natural riffle downstream, varies much less than that in an open channel. But with an eddy, recirculation of warm effluent during extreme droughts must be avoided.

Pumphouses in Figs. 1 and 3 are located on eddies, on the insides of river bends and protected by fringes of trees on the upstream shores.

A small land-bound pumphouse, where fish and floating hyacinths are the only debris problems is shown in Fig. 5.

The pumphouse should be as near the plant as practicable, accessible by truck during normal river stages, and easy to reach with a power line.

A river-bed contour survey as well as a careful subsurface study for the foundation are needed for safe design.

All sites present specific problems; such as avoiding long fire lines and taking advantage of different water pressures in the plant. For example, to have emergency water supply in the plants, pumps were designed in two steps for the stations in Figs. 1 and 4. Water from the river is lifted to a ground-level reservoir at the factory and then boosted with appropriate-head pumps to serve several plant needs. Fire pumps draw water from the reservoir; this arrangement provides several hours of emergency supply.

Type of pumphouse

Two types of pumphouse—wet and dry—prove economical for both large and small industrial plants. Both are hollow-pier structures set in the stream bed and exposed to floods. In the wet house, pumps are submerged; in the dry station, they are in a deep dry room below water level.

If the heart of the project—the pumps—are in the open instead of being submerged, it is much easier to check their physical condition.

Unsatisfactory experience with pumphouses located away from the stream and fed by open or closed channels leading from open water, proves that the safest and most foolproof arrangement puts the structure either completely or partly in the river. This is true except when debris and flood problems are negligible or poor foundation is avoided by moving inland.

Many types have been discarded for good reasons. They range from a makeshift suction line suspended in the river to elaborate equipment for

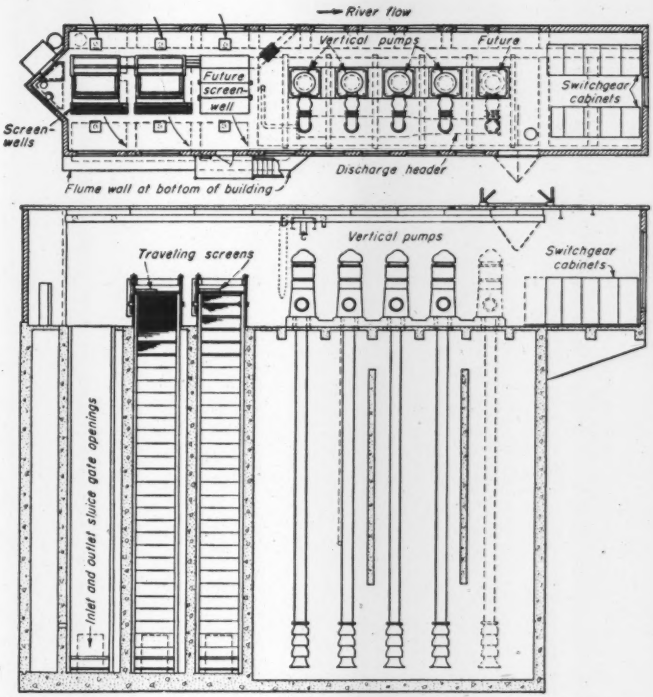


Fig. 2. PLAN AND ELEVATION of pumphouse at left. Flume, 15 ft. high, 6 ft. wide, at bottom of structure connects screenwell outlets with pump inlets at right.

handling water in quantity at large central power plants.

The simplest wet-type pumphouse is illustrated by a plant on the Middle River in Virginia (Fig. 4). It is an exposed, hollow-concrete pier with two 150-gpm., 93-ft. head submerged pumps, a trash rack and emergency port, a small shelter and a trestle walkway from the bank.

A low-cost wet pumphouse, such as shown in Fig. 5, however, serves a small industrial plant in Mexico. Since the site contained no rock or other "competent" foundation strata, the house was "floated" with no keys. It is moored, however, by an integral canal-end and pump-well wall. All concrete below the operating floor was placed in one pour.

Variation in lake level is only 15 ft. for this Mexican installation compared to 43.5 ft. for the wet-type station in Fig. 1 and 31 ft. for the dry house in Fig. 3.

The dry pumphouse is ideal when its cost can be justified. A good example is a plant on New River in Virginia (Fig. 3). It has withstood an extreme flood of 31 ft. without service interruption. Screen wells are upstream and the flume is keyed to the shore. Specially designed, screen-pit and flume floors do not require cleaning even after a flood.

Design of pumphouses

Minimum floor area of a pumphouse can be determined after screens, sluice gates and pumps have been selected. Knowing building area and height, construction cost can be estimated for both a wet and a dry pumphouse. This comparison will show premium cost for a dry house.

The weight and shape of the building are important. In a narrow, dry pumphouse as in Fig. 3, the foundation floor is about 4.5 ft. thick to counterbalance buoyancy; strainers, transformers and other equipment help weight the building. It is even desirable to design a narrow, wet pumphouse to reduce stream force, although this is an uneconomically shaped building according to normal standards. Some additional weighting is needed to resist buoyancy and flood forces.

Narrow buildings—particularly the dry type—may need some keying into rock to prevent sliding. Concrete keys and 2-in. steel dowels were needed, according to calculation, to prevent the dry house in Fig. 3 from sliding if trees and other debris should snag across its "bow."

A dry pumphouse should be designed not only to withstand exterior flood pressures but also to contain a building-full of water during a drought. Such a condition can result from a ruptured check valve, pump casing or pipe line in a tight pump room.

The least buoyant section of the pumphouse should be the nose or upstream end. When calculating buoyancy, it is assumed that one screenwell will be in use during an extreme flood. In a multi-screen-well structure, sluice gates to one well might be closed. Consequently the buoyant effect of empty wells should be provided for in design.

Not until floor area and house-type have been selected are foundations designed. These must be strong enough to withstand the force of floods, ice, suction at the rear and a tree snag on the point. Unequal friction on building sides is not a controlling factor. Bridge piers—well-tried structures in resisting identical forces—have been taken as models of both types of pumphouses for shape and foundation practices. A hollow-pier building has sufficient mass to insure large factors of safety. It is inherently stable on good foundations.

Selecting screens

Although a pair of logs moored in front of the intake followed by removable fish screens preclude clogging by floating hyacinths at two plants, most rivers and lakes require at least trash racks and traveling screens to protect condensers, water jackets and valves. Trash racks that collect logs, sticks and large pieces of debris protect traveling screens. They are often set at a slight angle when hand cleaned but in extreme cases a 60-deg. inclination may be advisable. With long racks it is difficult to justify the extra cost of the longer concrete aprons required by inclined racks.

Inclined screens for narrow pumphouses require not only an apron or concrete floor at the bottom extending into the river but also a cofferdam extension if the rack is much off vertical. Consequently, it is preferable to use a screen nearly vertical and put the apron within the building line.

Trash racks are usually made up of ⅜x2-in. steel bars, set 1½ in. apart and welded to suitable stiffeners. This design gives a surface easy to rake by hand.

Conditions at none of the plants

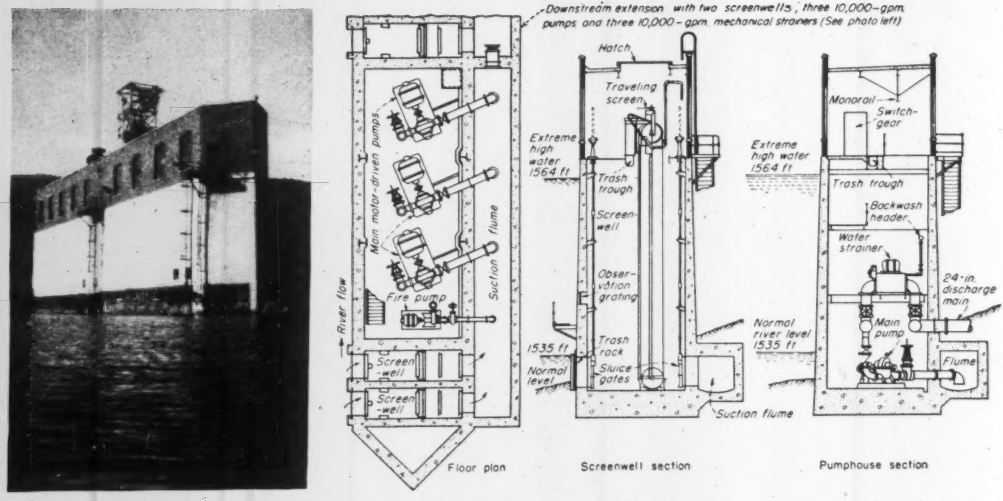


Fig. 3. TWO-SECTION DRY PUMPHOUSE has four separate screenwells, horizontal pumps at foundation slab with positive-head suctions at all river stages. Automatic, mechanical water strainers are located above pumps.

described are severe enough to justify installation of power-driven rakes. Such rakes are obtainable with milled teeth, discharge troughs, electric drives and time controls.

An overhead beam with a chain fall or power hoist should be included for removing trash racks. Racks should be built in short lengths for easy handling with lift hooks.

A platform with suitable curb should be provided to facilitate cleaning. A bricked-in platform directly above the screen is shown in Fig. 5; an open-steel "workway" can be seen in Fig. 3 just above the normal water level.

A curbed, full-width port in this platform facilitates use of a hand brush or rake. The operator levers the rake against the trash rack while pulling up or pushing down using the face of the curb as a fulcrum. (A favored rake is made of two one-inch, 10-ft. aluminum condenser tubes welded together and carrying a "long-bristled" wire brush about 12 in. long.)

Traveling screens dependable

Trash racks that pass maximum velocities of 2 fps. have given no trouble during very bad river conditions. They should be designed for not less than a two-foot difference in water level from front to rear. Guide slots in concrete should be wide enough to insert drop planks in place of the racks. This precaution permits the traveling-screen well to be dammed off for repairs, cleaning or inspection.

Greatly improved in design and material since they were adapted from a sewage works more than 30 years ago, traveling screens are highly dependable in operation. They are able to remove leaves, twigs, sticks and small debris.

Traveling screens, which must always be protected by grilles or trash racks, are always installed vertically, preferably one per well. A roof hatch will permit examination of foot shaft, seals, sprockets and chain by lifting the whole mechanism in the guides.

Woven, galvanized-wire, ⅜-in. mesh makes a satisfactory screen for rivers of the Middle Atlantic states.

Although used only seldom, screens are essential to efficient plant operation during many fall-and-spring days and after rains. They do not, however, remove hair from tannery waste or certain other matters found in sewage.

With proper initial alignment and regular adjustment to take up slack in chains, maintenance of traveling screens should be negligible.

Automatic control of screens has not been necessary on the projects described because an operator is always in attendance at the river pumphouse.

Traveling screens are usually guaranteed by manufacturers to pass water velocities of 2¼ fps. and resist a 2-ft. head loss. Screens travel up to 10 fpm. Debris is knocked off screens into refuse troughs by 60-70 psi. water jets.

The manufacturer's opinion should always be sought as to whether jet sprays are positioned in "front," that is, behind the ascending screen or beyond the head shaft where the screen descends. The "front" position is preferable because screening as well as spray action can be fully observed.

A wash-water pump on one project furnishes 450 gpm. at 70 psi. to jet-wash two 6x56-ft., 9-in. vertical center-to-center traveling screens. Each screen has a capacity of 20,000 gpm.

Screen capacity is forecast as follows: Calculate low-water cross section of the screenwell but deduct 6 in. of depth to allow for the boot; correct the area by subtracting wire area in the flow path; assume a water velocity of 2¼ to 4 fps. through the screen; and calculate capacity by multiplying clear area by velocity. A standard ⅜-in. No. 12-BWG mesh has 60 percent clear openings. Too slow a velocity for sandy streams may cause silt to deposit in the screen well.

Choosing the pumps

Capacities of pumps are dictated by variations in winter-and-summer plant demand. Multiple units are selected to provide one spare pump.

Site and plant location permit little leeway in choosing the operating head. A thorough study of stream records may show such a great range in water level that submerged pumps are indicated. The dry house is limited in height and area to avoid excessive buoyancy.

If a dry pumphouse is feasible, either vertical or horizontal pumps are used. Both types are dependable, but

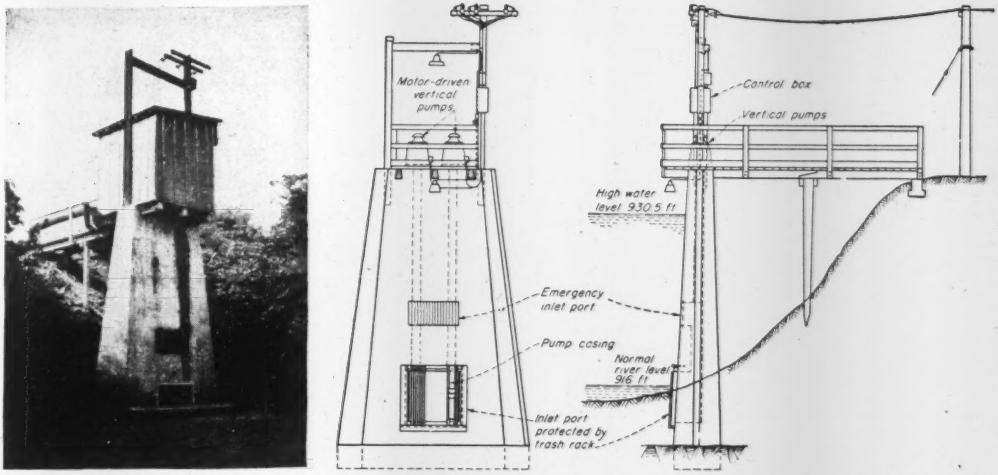


Fig. 4. INEXPENSIVE WET PUMPHOUSE carries two pumps on a hollow-concrete pier. Simple trash rack between river and pump inlets is provided. Emergency ports permits operation if main inlet is plugged by flood debris.

vertical multi-stage pumps in certain sizes are less reliable than horizontal units. In the past, 600-hp. vertical, synchronous-motor-driven units have given more electrical and lubrication troubles than vertical- or horizontal-induction and horizontal-synchronous motors.

Because dependability of operation is a first consideration, the author favors selection of pumps that best fit the houses and induction-motor drives. If an electrical-distribution problem demands power-factor correction at the pumphouse, another type of motor is required. In all cases, dependable operation calls for moderate motor speeds.

Foundations and pump supports for vertical units should be extra strong to limit amplitude of vibration and contribute extra weighting, usually needed to counteract buoyancy.

Piping precautions

Non-check valves and rubber expansion joints are essential for each pump-discharge line. Steel pipe is preferred for pumphouse headers and connections to plant mains, that is, across occasionally flooded flats. Sheet-steel piling, salvaged from the pumphouse cofferdam and re-driven across the flats parallel and adjacent to the discharge line, will shield the line from erosion and debris damage.

Automatic mechanical strainers are cheaper and occupy less space than sand filters and do not overload plant sewers. They permit a convenient layout when plant requirements are met. Housing costs are nil because space occupied in deep, dry pumphouses has no other use; also their weight means less concrete to counteract buoyancy.

Three automatic strainers are installed on a platform above the pumps in Figs. 3 and 7. These 5,000-gpm. strainers are located in the upstream pump room; three 10,000-gpm. units are included in the downstream extension of the house. The strainers occupy less and slightly more floor space than horizontal and vertical pumps of the same capacity, respectively. Electric motors for the 5,000- and 10,000-gpm. units are 5 and 7½ hp.

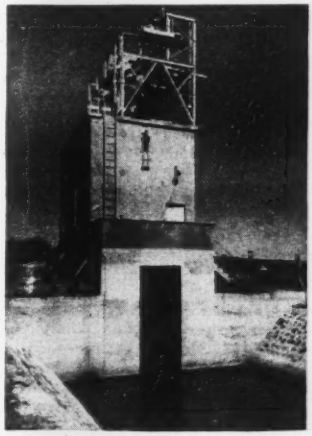


Fig. 5. LAND-BOUND WET PUMPHOUSE takes water with 15-ft. lake-level variation.

The 0.047-in. strainer is formed by a stainless-steel rotor built up with flat and corrugated-steel ribbons on edge. One rotor segment is continuously backwashed with three percent of the water strained. Strainer backwash plus traveling-screen debris is dumped overboard at the downstream end of the pumphouse.

Other considerations

Outside stairs are hinged and counterweighted to facilitate raising during floods.

When a fire pump is installed in the pumphouse, hose nozzles on the roof permit flow tests without special preparation. Nozzles are directed out over the river from a riser in the roof.

Ventilation is required in large pumphouses to dissipate heat from large electric motors. The pumphouses in Figs. 1 and 3 are equipped with 43,500- and 3,000-cfm. blowers, respectively.

An overhead line from the factory delivers steam to the pumping station in the winter. An emergency connection to the screens is provided. Wet ascending screens have frozen without steam protection.

A compressed-air pipe at the bottom of wells is used when needle ice forms.

Emergency ports in screenwells provide light as well as emergency water intakes if the lower inlets clog during floods. This condition, however, has not arisen.

Visible and easily read river-level gages are painted on steel angles at-

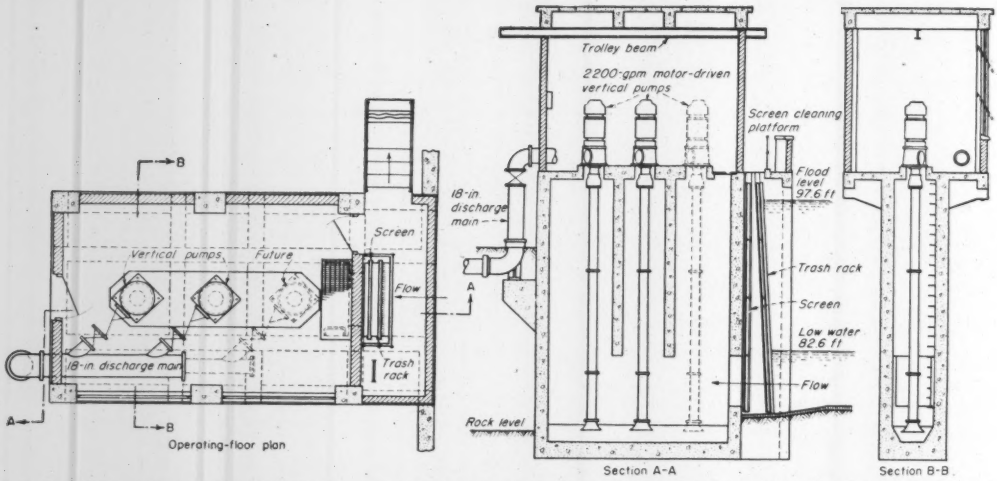


Fig. 6. WET PUMPHOUSE (FIG. 5) is located inland and connected to a lake by a short canal. Trash rack and stationary screen intercept fish and floating hyacinths. Wet well solves buoyancy problem at flood levels.

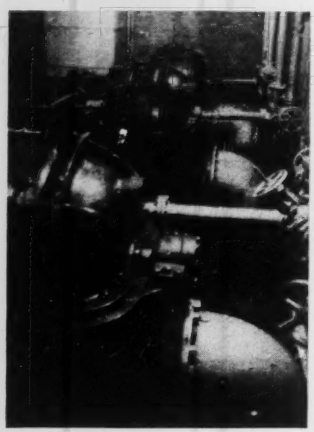


Fig. 7. THREE 5,000-GPM. mechanical strainers occupying little space discharge downstream from the pumphouse.

Fig. 8. A 10,000-GPM. VERTICAL PUMP is used in downstream extension of dry station with limited width (Fig. 3).

tached vertically to the "bow" of pumphouses.

An emergency rowboat and long rope are kept in readiness at each pumphouse.

An automatic priming system has given good service at a large inshore pumphouse where pumps draft from an intake well. Such complicated controls are unnecessary in all stations described as pumps are below low-water level.

Remote-level recording gages in pumphouses indicate reservoir or standpipe content. Phone, fire-alarm box and toilet are standard equipment.

Only during extreme conditions is more than one man needed to attend to all equipment in a pumphouse.

Cofferdam or permanent flume?

A temporary cofferdam is usually required before the foundations for either the wet or dry pumphouse can be put down. Cofferdam costs for pumphouses shown in Figs. 1 and 3 were less than for permanent flumes across river flats to structures set above flood stages.

Another disadvantage of intake flumes is the additional maintenance and cleaning cost where rivers carry large quantities of sand and gravel.

In addition, flume intakes must be protected at the river entrance by trash racks with operating equipment. This arrangement not only incurs the additional cost of a construction cofferdam but also splits operation of the pumphouse and results in poorer protection at the critical operating point —the intake.

Public Housing Pays Tax In New York City

Tax payments on public housing projects totaled $2,281,767 for the year 1948, according to Thomas F. Farrell, chairman of the New York City Housing Authority.

The figure represents 122 percent of the taxes assessed on the sites at the time the authority acquired them.

Taxes of $1,166,525 were paid on projects and sites under the state program, and a $1,115,242 payment in lieu of taxes was made on city, federal and veterans emergency projects.

Included in these calculations are: Eight projects built under the federal program, with payments based on 5 percent of rental income, and three based on 10 percent; two city projects and 20 state projects, rehabilitation projects and sites, with payments based on the taxes assessed the year the properties were acquired; and eight veterans temporary projects, under the federal-city program, on which the equivalent of full real estate taxes were paid.

British Builder Scores Multiple Quantity Surveys

T. Forster
General Manager, Welwyn Builders Ltd.,
Welwyn, Garden City, England.

Editor's Note: The following article was submitted to Engineering News-Record by the author as a comment on the article "Do Our Estimates Cost Too Much?" by R. D. Sannit, in the Dec. 9, 1948, issue, p. 107.

THE IRRATIONAL SYSTEM of requiring each general contractor and his subcontractors to undertake a quantity survey before submitting a bid, as described by Mr. Sannit, is a prodigious waste of effort.

This uneconomic duplication does not obtain in Great Britain, where in general, for all competitive projects over $7,500, a bill of quantities is supplied to each bidder.

Contractors found that the mutual employment of one quantity surveyor to take off the quantities for a job resulted in a substantial saving in their overhead costs. This conclusion gave rise to the independent quantity surveyor who in a judicial capacity could be trusted both by the owner and the builder. And, instead of the owner paying indirectly (through the final bid amount) for this service, the surveyor can be employed directly as a consultant.

It is a recurrent source of wonder to one who has worked on both sides of the Atlantic to find it reiterated by Mr. Sannit that "nothing along this line has been attempted as yet." It must be about thirty years ago that Leslie H. Allen wrote: "There are many difficulties ahead of the establishment of a quantity surveying system in this country, but I believe that if all those interested will work together for a common end and in a systematic manner, the end desired will be achieved sooner than at present appears possible."

In Great Britain, the bill of quantities is prepared by a "chartered surveyor", usually nominated by the engineer or architect, and paid by the owner. The fee for this service is about 2 percent of the job. The cost of pricing by the bidder should not exceed, on the average, more than one-quarter of one percent. Inclusion of all obligations in the quantity survey provides a common basis for each contractor to use as a basis for his bid. When priced and incorporated in the contract, it also serves as a schedule on which subsequent variations of the work can be valued, thus obviating disputes arising as to what is and what is not in the contract.

To the argument that delay in starting a job will be an inevitable result of this preparation of bills of quantities, it may be answered that the information on which such surveys are based must be final and detailed to insure that the surveys really represent the works that will be carried out. In aggregate, time actually can be saved.

In England, the quantity surveyor forms an integral part of the construction industry. His professional status is guaranteed by examination after a long training in construction, quantity surveying, law of contract and other subjects. This enables him to put into words every obligation or service required in the execution of any project.

Method standardized

It is understood, of course, that a bill of quantities is a highly technical document. To preclude ambiguity in the description of its items, diversity of practice and the idiosyncracies of individual surveyors, it is essential that uniformity in the method of its preparation should be established. Such necessary standardization has been achieved in England by agreement between the negotiating bodies of the building trades employers and chartered surveyors. This collaboration resulted in the publication of the Standard Method of Measurement of Building Works in 1922.

It would be impossible in the confines of this article to describe in detail the preparation of a bill of quantities. Briefly, however, the procedure consists of taking off, working up, and billing. Taking off by trades, although it possesses certain advantages such as clearing off each clause in the specification progressively, has been superseded by measuring all walls, etc., in the first instance, ignoring deductions for window or door openings. These deductions are made when the other work necessary to the openings—such as lintels, sills, finishings, doors, windows and painting—are taken into account. After the body of the building has been dealt with in this way, the joinery finishings, drains, and the like are finally taken off.

This pragmatic procedure may appear at first glance to be complicated, but time is saved when going over the same ground for different trades. Otherwise, estimating an external door opening, for example, would involve plastering, joinery, hardware and painting—all estimated at different times and at different places in the take-off process, increasing the liability to error. Moreover, any necessary alteration would mean searching through all the dimensions for the purpose of adjusting the variations.

The working-up consists of working out the volumes, areas, etc., collecting similar descriptions and classifying them in a recognized order preparatory to writing the bill.

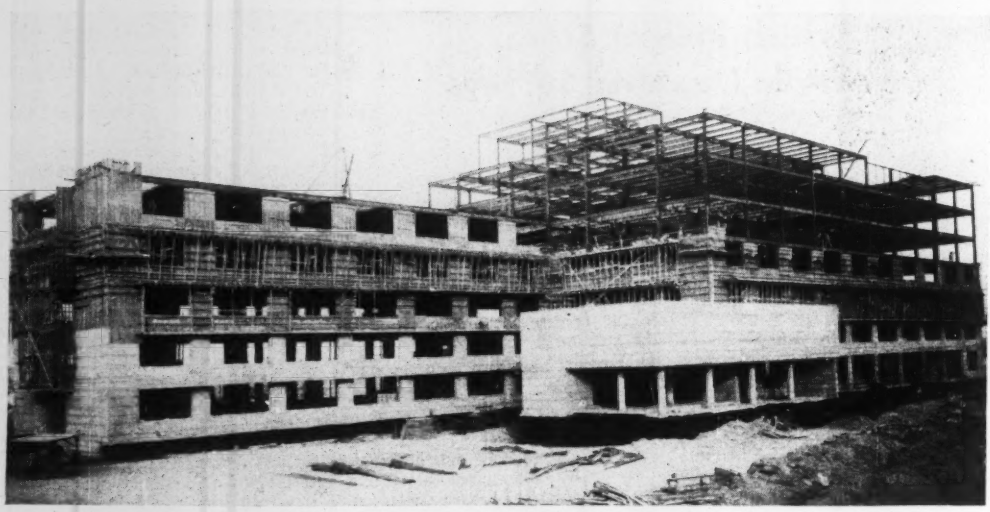
Billing of course, is the collection of the total work that has to be executed under the various trade headings in a final form for the bidder to price.

Every item of expenditure in which the successful bidder would be involved should be incorporated in a bill of quantities. The first section of the bill might contain a brief description of the works, followed by short headings explaining the conditions of contract against which the contractor can place the prices he may consider necessary to comply. In succession would follow such items as temporary sheds, offices, water, roads and lighting; protection; shoring; supervision; access to site; insurance; bond and the like. It will be found convenient before proceeding to bill the various trades to give a description of materials and preambles affecting prices. Each trade is then billed and the total value of the collected trades brought to a summary.

The Standard Method of Measurement described above is applicable to both building and engineering work. It is not unchangeable and it has been amended from time to time.

Perhaps it can best be described as an emerging document, keeping abreast of new methods of construction and inventive genius. Its value is not confined to the offering of a proposal. Obviously, it possesses intrinsic value to the contractor, permitting him to place his orders and subcontracts with minimum expense.

The information it contains can readily be used for phasing and programming the contract and it forms an invaluable basis for job cost estimates and preparation of interim certificates of payment.



Steel Frame for the Fresno VA hospital is designed for vertical load, while the . . .

Building Walls Resist Earthquakes

LOCAL CLIMATIC and geological conditions dictated design for earthquake resistance and complete air conditioning in the Fresno, Calif., Veterans Administration hospital.

In general, the hospital is functionally similar to other veterans hospitals under construction in the U. S., such as the Ft. Hamilton Hospitals in Brooklyn (ENR May 27, 1948, vol. p. 778). However, earthquake experience in California requires special consideration and the extreme summer temperature in Fresno makes complete air conditioning advisable. The Fresno hospital also differs in layout: a double-corridor system is used, whereas single corridors were built at Ft. Hamilton and elsewhere.

This 250-bed general hospital is located just north of the city limits of Fresno. Its major axis is east and west, with east and west wings slightly offset from each other at the center to form an entryway and utility core. The east wing is seven stories high and the west wing is five.

Building details

The central building has its major axis in an east-west direction. The front of the building faces south. Total length is 359 ft. Each wing is 65 ft. wide and has offices, wards, or single rooms around the outside with two corridors around a central part that is used for nurses' stations, lavatories and utility rooms.

The first three floors house offices, out-patients service, operating rooms and physiotherapy rooms. The remaining floors contain single rooms, double rooms and 4 and 16-bed wards. The seventh floor is for psychiatric patients.

The building has a terra cotta facing and both aluminum and steel sash are used. The windows in the operating rooms are double glazed. Windows on the south side have a reinforced concrete canopy extending 2 ft. 6 in. out from the building face, to protect the room from the summer sun, though in winter when the sun has a low zenith, sunlight can enter the rooms.

Earthquake resistant design

The structural design for resisting earthquake forces calls for the steel frame to support vertical loads and the concrete shell to resist lateral forces, with earthquake forces being the governing lateral force.

The design meets the requirements of the Engineering manual of the Corps of Engineers, which says that in regions subject to earthquakes, designs must satisfy the requirements of the Uniform Building Code of the Pacific Coast Building Officials Conference. (The building was designed in 1946, and provisions of the 1946 edition of the Uniform Code were the basis of the lateral load design.)

Thus, the horizontal force applied at any floor level is CW, where W equals the total dead load plus one-half the total live load at and above the point of elevation under construction and C is a coefficient that, in the Fresno area and for the foundation conditions encountered, is 0.04.

All of California is considered an area of potential seismic activity. However, the earthquake history in Fresno (approximately halfway between San Francisco and Los Angeles) does not indicate experience with earthquakes of the same magnitude as have occurred in either the San Francisco or the Los Angeles area. It therefore may be of interest to compare the factor used with the loading established by the Los Angeles and San Francisco codes.

The Los Angeles Building Code provides this horizontal force be $0.6W_4/(N + 4.5)$, where W_4 is the dead weight of the building above the floor level and N is the number of stories above the one under consideration. Note that this is based on dead load only.

This means that the factor used at Fresno puts less horizontal load in the upper stories than the Los Angeles

code requires, although the load on the lower stories is about the same.

The PCBOC adopted earthquake provisions of the type used in the Los Angeles code in the 1949 edition of the Uniform Code.

The San Francisco code, the strictest of the three, provides that the horizontal force be $2W/(24 + N)$. In this case W is the dead load plus 0.6 times the live load where the live load is under 100 psf. and 0.8 times the live load where more than 100 psf. This code also requires that in a steel frame building, the frame be designed to resist one-half the lateral force even with the entire force taken by the concrete shell.

Concrete takes lateral force

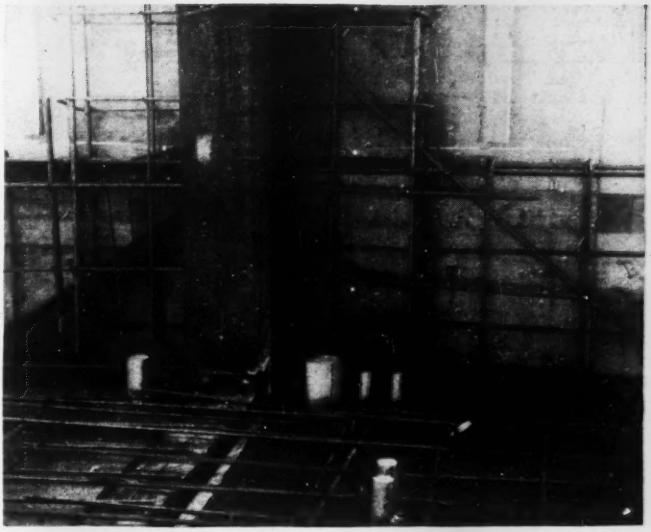
The horizontal forces in the Fresno hospital design are considered to be acting on the floor at the center of gravity of the vertical loads. The reinforced concrete floor, acting as a diaphragm, distributes this load to the various wall members in proportion to their rigidity. These walls designed to resist the direct shears plus any torsional shear caused by eccentricity in the loading.

The resisting members are 12-in. wide by 5-ft. 4½-in. deep reinforced concrete spandrel beams and 12-in. thick by 5-ft. 1-in. wide column piers between windows. Some of the principal reinforcing had to be passed through holes in the steel columns to provide continuity. Typical spandrel beams have two $\frac{7}{8}$-in. round bars as tension reinforcement at top and bottom of the beam, one of which is placed just outside the steel column and one through a hole in the column. The remainder of the reinforcing for the beam is similar to that required for any deep beam—including stirrups where shear is a factor.

In some instances, the flange stress in the spandrel was so large that it was found advantageous to provide small steel trusses instead of reinforcing bars. These trusses are connected to the columns, but provide lateral resistance and occur in the second, third and fourth floors on the end of the building, and on the sides near the end.

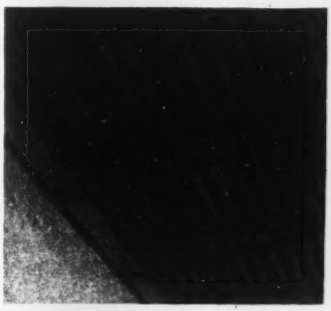
The reinforcing at one of the third floor columns is shown in an accompanying illustration. Note that a truss is used in the spandrel to the left of the column and reinforcing bars to the right. The diagonal bar resists the tendency to develop a shrinkage crack at the corner of the window.

No complicated column connections are required for lateral force resistance. The steel frame is designed simply as a system of columns and connecting members. A building cross-section would show three bays—17, 28, and 17 ft. Steel columns are spliced just above every other floor and cross members frame into the columns.



EXTRA REINFORCING in the deep spandrel beams and the wide exterior columns enables the concrete shell to resist seismic forces. Half of the spandrel beam lies below floor level.

Another problem encountered in the design arose from a potentially high water table that required special consideration to obtain watertight concrete walls and floor slab in the sub-basement. The level of the sub-basement floor slab is 24 ft. below the first floor level and 19 ft. below original ground level. Excavated material was used to raise the general ground level immediately adjacent to the building.



METAL LATHE on a canopy for one of the outlying buildings supports the fresh concrete for the roof without any special forms concrete was poured directly on the lath. Such canopies were used to protect attendants' quarters from sun-glare.

A layer of grout 1½ in. thick was first poured as a base for the sub-basement slab. Then a four-ply roofing felt with lapped joints was hot-coated in place. This was followed by another 1½-in. thickness of grout as a protective measure during construction. Finally, the floor slab reinforcing was placed and the 10-in. slab cast.

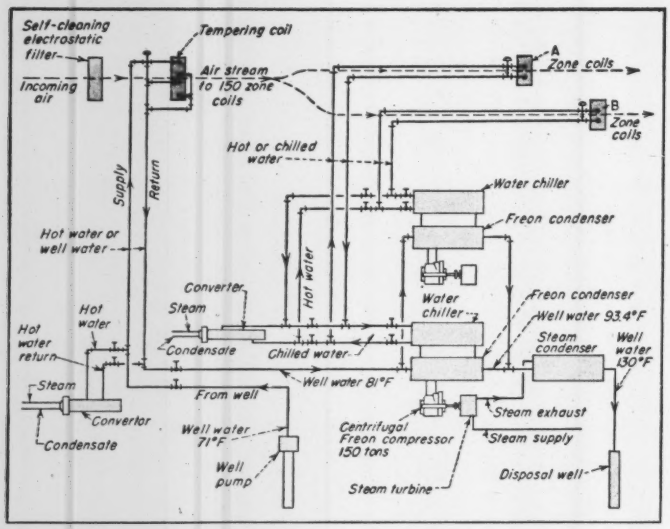
The membrane was extended 3½ ft. up the walls and columns from the finished floor level. Reinforcing steel was placed on the dry side of the membrane on the wall and columns as well as the floor.

Zone air conditioning

The hospital is located in California's San Joaquin Valley where the summer is very hot and dry. Because of this, the Fresno hospital is the only veterans' hospital included in the current program that is entirely air conditioned.

The air-conditioning system is unique in that the same system of pipes, coils and air ducts is used for both heating and cooling the building, the heating system being a hot water system rather than a steam system. Provision is made so that parts of the building can be heated and part be cooled if that be necessary.

Air tempered to 60 deg. F. is circulated via ducts to zone coils located throughout the building—there are more than 150 zones, consisting of one or more rooms each. Each zone is



THE SAME PIPING AND DUCT system is used for both heating and cooling as shown by this schematic diagram. By regulation of the proper valves, hot water can be directed to one set of zone coils and chilled water to another.

heated or cooled independently, temperature in the zones being regulated by a combination heating and cooling thermostat. These thermostats may be regulated only by a key under the control of the building superintendent.

Although summer weather in the Fresno area is very warm, night temperatures are quite often cool. For this reason, occasions may arise when it is desirable to heat the shady side of the building in the early daytime hours. Piping systems that supply hot or cold water to the zone coils are so arranged that the north side of the building (shady side) can be on heating cycle, while the south side is on cooling cycle. When part of the building is being heated and part cooled, the tempering coil where the air enters the building does not operate.

If the main cooling system is not in operation and cooling is required in the operating rooms, small air-cooled condensing units will handle the load by direct expansion zone coils.

Steam turbine power

The air-conditioning system centers around 150-ton, steam turbine-driven, centrifugal condensers that supply chilled water to the same piping system and zone coils as are used in the heating system. Steam-turbine power was selected because in a hospital steam must be available 24 hours a day for such purposes as sterilizers, kitchen and laundry equipment. Thus, the addition of turbines for powering air conditioners added little, if any, required capacity to the boilers.

No humidity control

Because the air during hot weather is almost always very low in humidity, and for sanitary reasons, it was considered desirable to use 100 percent new air, with no recirculation. For these reasons, no dehumidification was required at Fresno. Humidification, however, is provided by pan-type humidifiers at the tempering coils during the heating cycle.

In operating rooms, however, it is necessary to maintain a relative humidity of some 50 percent in order to reduce possibility of electrostatic discharges. Statistics show that one operation in every 50,000 results in an explosion of anesthetic gases. Half of these explosions are caused by electrostatic discharges due to low humidity. Accordingly, pan-type humidifiers were installed for each operating room. The pan-type was selected instead of a spray type that introduces live steam into the air because the use of boiler compounds would introduce impurities.

Steam for hospital purposes is supplied by three 165-hp. boilers of the water-wall type. This type of boiler normally operates at 200 percent of rated capacity and is capable of operating even higher. Accordingly, enough reserve capacity is available should any single boiler be shut down.

The water supply system is an excellent example of the emergency facilities provided in hospital construction. Water is obtained from wells on the property and there is also a tie-in to Fresno city water. The pump on one well has a natural gas engine as well as an electric motor so that standby pumping is available in the event of failure of the power system.

Two pressurized water tanks in the basement contain storage water for fire-fighting purposes. Residual air pressure in this tank keeps the water flowing for some time after all power is shut off. A natural gas-driven generator is also provided for emergency power supply.

Another precaution taken in the design of the mechanical equipment at the Fresno hospital is the providing of an electrostatic air filter. This filter takes out dust particles that may harbor germs in the incoming air. The filter element is automatically cleaned by continuously passing through a viscous oil bath.

Other structures and staff

The hospital is located on a 20-acre site just north of the Fresno city limits. In addition to the main building, seven outlying buildings are under construction, including a six-room home for the manager, two duplex apartment buildings containing two five-room apartments each, nurses' quarters, attendants' quarters, a garage and a powerhouse.

The outlying buildings are all one-story concrete buildings with flat roofs. Roof slabs on several are reinforced with ribbed metal lath resting on open-web joists. Concrete was poured directly on the metal lath with no forms required.

All utilities except sewers are brought to the outlying buildings in concrete trenches, to permit easy access to the piping for repairs.

The architect-engineer contract for the Fresno, Calif., Veterans Hospital is held by Masten & Hurd, architects, and Huber & Knapik, engineers, both of San Francisco. Mechanical and electrical engineers for the architect-engineer are the Coddington Co., San Francisco. General contractor is the J. I. Barnes Co., Santa Monica, Calif., H. M. Goldsworthy, West Coast manager, and A. Aegerter, project superintendent.

Planning and construction of this hospital is under the supervision of the Corps of Engineers. Col. J. S. Gorlinski is district engineer of the Sacramento, Calif., district, and E. M. Kanzler is project engineer for the corps.

FIELD AND OFFICE

New Machine Speeds Highway Striping

An improved striping machine, which can paint three lines at the rate of 700 fpm., is being used by the Washington State Highway Department to stripe new pavements and restripe old ones quickly and safely.

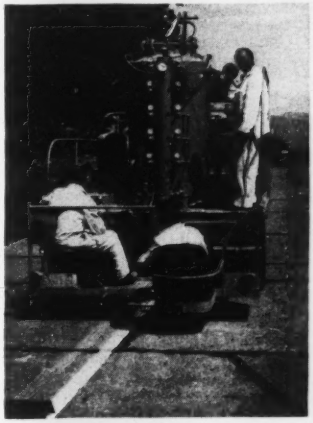
Built at a cost of $3000, the truck-mounted machine consists of three paint-storage tanks, a gasoline motor-driven air compressor, a valve manifold for regulating paint pressures, and a fifth wheel that controls the length of stripe painted.

Storage tanks are for white paint (240 gal.), yellow paint (650 gal.) and a solvent used to dry paints during night-time operations.

Operating a timing device, the fifth wheel is geared to a distributor on which various types of skips can be set as well as rotated in a slip clutch. This arrangement permits adjustment to re-stripe existing lines accurately. The timer actuates a solenoid mechanism that operates an airbrake diaphragm. The diaphragm in turn controls the compressed-air paint guns.

Included on the truck are: a communication system between the driver and the operator in the rear; a loud speaker mounted on the cab through which records are played to warn travelers of freshly painted lines; and a sighting device that reflects line position to the driver.

The sighting device consists of two mirrors mounted at 45 deg. angles on the front of the truck. One mirror at windshield height is supported above another at bumper height, both of which are on the centerline of the truck. This arrangement permits the driver to trace existing stripes as well as points established on unmarked roads as the truck moves forward.



THE MOBILE SPRAYER is operated by three workmen and a driver. Spray guns are controlled by the painter (left) while warning signs are dropped on wet stripes by a workman (center). The foreman (right) provides over-all supervision.

Points for locating new stripes are placed by a survey crew working ahead of the machine.

Piping on the mobile striping machine has been improved so that Scotchlite beads can be applied in the stripe on main highways. All recesses and sharp heads in the lines have been eliminated by use of copper tubing and special pipe fittings to the tanks. This prevents stoppages of paint and beads in pipes feeding the spray guns.

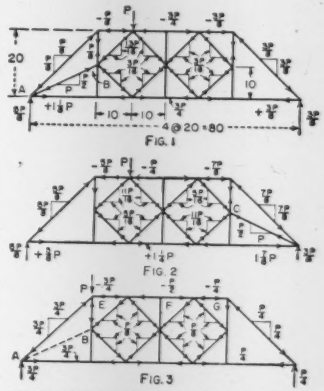
The striping machine has been developed over a ten-year period of experimentation.

THE STATE OF WASHINGTON'S mobile highway striping machine is equipped with air-operated paint guns, tanks for yellow and white paint, a public-address system and a sighting device for the driver.

Horizontal Truss Designed To Clear Large Floor Openings

The unconventional arrangement of the horizontal bracing shown in Fig. 1 to 3 proved convenient in clearing the large openings needed in the fan floor of a power house. This construction might be called a K-truss with rhomboid panels.

The most important consideration in the design of a truss of this type is that stability is maintained under all conditions of loading. To determine whether the K-truss is stable, the stability criterion, $2j-3$, where j is the number of joints, was used. When the number of bars in a truss is less than $2j-3$, the truss is unstable; when it equals $2j-3$, the truss is stable and determinate; and when it is greater, the truss is stable but indeterminate.



STRESSES in a K-type horizontal truss for critical loadings.

The critical loading (Figs. 1 and 2), is shown with the corresponding horizontal and vertical stress components. Either arrangement is stable, but corresponding stresses are different.

The analysis for a load at a main panel point is in Fig. 3. There is no stress in member AB when a load is placed at a main panel point, such as E, F or G. Member AB only functions when the loading produces an unbalanced component in the web system. It is similar in action to a counter in a truss with rod diagonals. —Otto Ebel, *designer, Consolidated Edison Co., New York, N. Y.*

READER COMMENT

Quantity Surveys

Sir: I have read with great interest (ENR Dec. 9, 1948, p. 107) the article by R. D. Sannit "Do Our Estimates Cost Too Much"? As far as I can see, he seems to be advocating something very like the ordinary British practice in such matters, and calls it "Guaranteed Quantities Surveys System".

When the quantities used by British architects or engineers are prepared by a qualified quantity surveyor or engineer, although they are not actually guaranteed, they can be looked upon as guaranteed. Although the contractor is always at liberty to check them, in practice he rarely does, even when making a lump sum contract.

In a contract based on quantities prepared in this way each item is priced and the schedule of quantities can be used for all modifications in the design so that when the work is completed there ought to be no question as to the proper sum to be paid.

W. L. Lowe-Brown
Sir M. MacDonald & Partners
Chartered Civil Engineers
London, Eng.

(Further comment on British practice will be found on p. 57 of this issue.)

Cutting Estimating Costs

Apparently R. D. Sannit hopes to wave a magic wand and cure all the ills of the contractors in their estimating departments (ENR Dec. 9, p. 107). Yes, estimates cost too much, to the contractor, but not to the owner.

Architects and engineers prepare plans and specifications. Most of these plans and specifications are good, but the percentage of plans unfit to carry the seal of an architect is too high.

The state laws license the architects and engineers of the country, but there the state supervision ends, unless the law is flagrantly broken. Contractors receive many plans that could be made better by high-school students; specifications that appear to have been written by a sixth grader. These are the things that cost the contractor time and money.

Many of our estimators today are former engineers or superintendents and have years of experience in the construction industry. This type of personnel with the help of modern office equipment, make few if any errors in an estimate.

A good course in estimating taught at a technical high school, with a year on construction as a cost clerk and two years work with an experienced man will give a young man a good background for a career in estimating.

Quantity surveys are not new, there are groups in several cities that have been making material surveys for years. They haven't been too successful in the sale of their work.

What will we gain by licensing our estimators, if we could induce architects to accept the survey idea? A bond would be much better, as it would provide supervision and compensation in case of an error. When the quantity survey is placed in the architects hands, the owner will pay for this service, thus increasing his cost instead of lowering it.

The way to lower estimating cost to the contractor is to provide plans that are drawn to a scale that can be read, with all measurements correctly placed, details not crowded on the sheet, and specifications written without misleading qualifications.

In the near future contractors may charge owners for the time wasted estimating work that is put out for a cost estimate at competitive prices. If a contract is not awarded within 30 days to one of the bidders, a charge should be made.

Lewis J. Dennis
Buffalo, N. Y.

Notable Bridges

Sir: Mr. Steinman in his very interesting article (ENR Dec. 9, 1948, p. 92) has not given a list of concrete girder bridges among his "notable bridges." He only refers to the Villeneuve bridge in France as representing the longest span of this type.

It may be of interest to add a list of such bridges. Since Mr. Steinman's limit for steel plate girder bridges is 250 ft., I have assumed the arbitrary limit of 200 ft. for the corresponding type in concrete and have compiled 11 bridges. I cannot claim that the list is complete, and it may well not be since no U. S. bridge is included.

Although no progress has been made since 1939, the application of prestressing should allow a further increase of span for this type of bridge.

K. Hajnal-Konyi
Consulting Engineer
London, England

Underground Factories

Sir: Your article "How Underground Factories Performed," on page 107 of the October 14, 1948 edition of your excellent magazine Engineering News-Record is very interesting and rates honor to the editors of McGraw-Hill who got together this abundant documentation.

May I be permitted to tell you, however, that it is unfortunate that in the course of their researches, they did not notice the abominable fact that the underground factories have been excavated, managed and used by French, Belgian, Polish, Russian and others who died in the hundreds of thousands under the most abject psysical and moral conditions.

If your editors had lost a brother in Ohrdruf or a father in Dora, they would undoubtedly have treated the question with less serenity and more humanity.

Any Frenchman in reading your article will ask himself if your editors were unable to see or did not dare to speak.

The two alternatives are not worthy either of Engineering News-Record or of the great McGraw-Hill Company.

P. Bourdon-Michelin
Paris, France

Editor's Note—In collecting the information there was no thought either of minimizing or avoiding the sad but well known fact that many people

CONCRETE GIRDER BRIDGES

Built	Bridge	Location	Span (Ft.)
1939.	Villeneuve-St. George (Seine)	France	256
1942.	Waterloo (Thames)	London (England)	253
?	Klockestrand Sound	Sweden	234
1938.	Brye-sur Marne	France	232
1937.	Aue	Germany	226
1930.	Peixe	Sta. Catharina (Brazil)	223
1947.	Pont des Arches (Meuse)	Liege (Belgium)	219
1924.	Toronto	Canada	210
1948.	Wandre (Meuse)	Belgium	208
1935.	Bernburg (Saale)	Germany	203
1930.	Grossmehring (Danube)	Germany	202

died in the building and operation of some of these underground factories. The objective was to show the advantages and disadvantages of placing manufacturing facilities underground if that ever should be necessary or desirable. How the factories were built did not seem to be germane to this objective. The one in Sweden of course took no toll of human life and was built in as normal a manner as an above-ground factory.

Diesel Dewatering at Downsville Dam

Sir: It has been called to our attention that the ENGINEERING NEWS-RECORD in its January 6th article on the Downsville Dam (p. 60) inadvertently slighted the important part played by GM diesel engines in the construction of the dam.

The article mentions that the Moretrench Corporation wellpoint pumps used on the job were powered by "gasoline" engines and the caption under a photograph illustrating the article makes the same statement.

We are informed by Mr. J. K. Hampton, our sales engineer who serves the Moretrench Corporation, that there were ten wellpoints (pumps) whose job it was to keep the excavation for the dam core dry and that they were all powered by three and four-cylinder GM Series 71 2-cycle diesel engines.

This fact has been verified with Moretrench Corporation and we regret that the ENGINEERING NEWS-RECORD, whose comments are generally known for accuracy, could have been led into such an error.

Ordinarily the oversight would not have amounted to much but this particular job was one which (so we are told) the contractors did not believe could be handled with wellpoint pumps, and we are proud that our 2-cycle diesel engines had a part in licking such a difficult drainage job.

J. W. BROWN
Advertising Manager
Detroit Diesel Engine Division
General Motors Corp.

Kinks in Bridge Cables

Sir: Wire failures in the cables of two recently built bridges are reported in your journal (ENR Sept. 2, 1948 and Nov. 11, 1948) to be due to sharp kinks in the cables at the suspender clamps and to be aggravated by cable vibrations.

The photo shows the type of clamps used in cable suspension bridges by the Department of Main Roads, N.S.W., Australia. In these, stresses additional to direct stresses, that is those produced by bending due to kinks, are eliminated by locating the kinks in the middle of gussets.

AUSTRALIAN practice is to use gussets at suspender points to eliminate bending in bridge cables.

The clamp detail shown in the photo is from the Suspension Bridge at Kindee, N.S.W., Australia. It is described in my paper in the December, 1937 issue of the Journal of the Institution of Engineers, Australia, and reference is made to this type of connection in the March, 1938 issue of "Civil Engineering", page 209, by D. B. Steinman.

V. KARMALSKY
Engineer, Department of Main Roads, New South Wales
Sydney, Australia

Prestressed Pavements

Sir: With reference to the editorial in the issue of Jan. 6, p. 39, dealing with prestressed concrete pavements, in which you state that the floor slab appears to have a load no more severe than that on normal highways.

As a matter of fact, the loading on the slab was considerably greater, since the 10-ton reels are very closely spaced, as seen in the illustration on page 68; also, the pressures of their rims are at least ten times greater than the 50 to 100 psi. which is the typical tire pressure of a highway vehicle.

You further state that the 9-in. unreinforced slab, underneath the prestressed carpet, could by itself carry the load without distress. Actually, to do this, such a slab would require numerous expansion joints in an effort to prevent cracking, and even then results would have been doubtful.

Bulletin No. 23 of the University of Illinois deals with the experience in Illinois with joints and concrete pavements. This report arrives at the conclusion that no joint has been found so far to prevent or retard the occurrence of transverse cracks and that the cracking increases with age. It also mentions that the situation is worse on fill than on natural ground. It was not felt, therefore, that a slab with joints would do justice to the job in hand in which a crackless slab of 96 by 144 ft. was specified, a task which has been achieved giving full satisfaction to date.

The 9-in. base supporting the prestressed slab is not to be taken as the final minimum thickness for a base for such an elastic carpet, the performance of which, as to load distribution and bridging of cracks was not known at the time the slab was designed.

A conservative attitude had to be adopted so as not to transgress on acknowledged methods of computation of thicknesses. A better appraisal can now be made of the value of a prestressed slab under controlled conditions of friction on the base, especially if the latter is cracked.

The main use for this type of slab is seen in the lining of existing roads or airport runways which are badly cracked or too weak to support increased loading.

As to prestressing on horiontal and vertical curves which you mention, no new principle is involved. It is just a task of working out suitable details towards which end considerable progress in the meantime has been made.

L. COFF
Consulting Engineer
New York

Concrete for French Dam

Sir: In the article on the Lake Girotte Dam in France (ENR Dec. 23, p. 59) the following statement is made: "The tests also showed the value of a high water-cement ratio. Consequently, some of the middle sizes of aggregates were eliminated and a water-cement ratio of 1.8 to 2:0 was attained, compared to the more common ratio in France of 1.4 to 1.5."

Is this statement correct? Is not the ratio as given a cement-water ratio?

ELMER L. MUNGER
Iowa State College
Ames, Iowa.

Editor's Note: Mr. Munger is correct. The ratio should have been characterized as a cement-water ratio, not a water-cement ratio.

BOOK REVIEWS

City Planning

PLANNING THE MODERN CITY—Two volumes. By Harold MacLean Lewis, 284 and 244 pp. John Wiley & Sons, New York 16. $6 each volume.

"Planning the Modern City" is based on that excellent engineering treatise, "The Planning of the Modern City" written in 1916 by the late Nelson P. Lewis, father of the present author. The earlier volume was one of the most useful tools given the city planner in those earlier years. It was a voice decrying the "City Beautiful" as the essential objective and giving a clear, concise, and well proportioned treatise on city planning principles by a great engineer who believed that the city beautiful was a by-product of sound engineering.

Th present work is a two-volume treatment of the subject, which is divided into six parts. In Volume I, Part 1 covers the purpose, history, and elements of a city plan; Part 2, communications; Part 3, a pattern for land use. In Volume II, Part 4 covers community planning, including the neighborhood theory and the problems of housing and redevelopment; Part 5, special planning problems; and Part 6, legal, economic, and administrative problems and the opportunities and responsibilities of the civil engineer in this field of planning.

The author takes cognizance of the great strides that have been made in city planning since the original volume was published and the wider acceptance of planning by cities as one of the reasons for this progress. This newer work recites the modern technique with examples of practically all conditions and trends in zoning, civic centers, transportation, express highways and the present theory of locating these limited access highways through urban areas and convenient to the business centers of cities. These volumes are devoted almost entirely to the engineering aspects of city planning as a sound base for building or rebuilding cities. They give full credit to other professional groups and their contributions in architecture, sociology, law, and economics.

The author's treatment of examples of planned communities, shopping centers, subdivision design and control, low-cost housing, development of neighborhoods to resist blight, parking surveys, auto terminals, open-wall ramp garages, industrial districts, garden cities, the pay-as-you-go system of financing city planning projects, and special assessment methods, gives the very latest information that has been developed in the city planning field. The cause and effect of slums and the economic value of a city plan are among other special topics dealt with.

It is the considered opinion of this reviewer that these volumes on planning the modern city are the best working tool that is now available in the city planning field.—Reviewed by G. H. HERROLD, Director, City Planning St. Paul, Minn.

Imaginary Engineer

BIG FREEZE—By Bellamy Partridge. 236 pp. Thomas V. Crowell Co., New York 16, N. Y. $2.75.

This is the tale of an imaginary engineer engaged in completing the Croton reservoir and aqueduct to give New York its first major water-supply system. The author says that the account of the failure of the embankment that formed part of the original Croton dam, of the labor troubles and of the freezing of the too shallow mains—from which the book gets its title—are all based on authentic records. That doubtless is a fact, but engineers among his readers will find it difficult to accept some of the details of those events that the author has supplied to enliven his story. Nevertheless, it is an amusing tale that gives a good picture of the problems faced by those who pioneered in bringing safe drinking water to New York.

For Specification Writers

SPECIFICATION WORK SHEETS—By Ben H. Dyer. 198 pp. (Paper cover). American Institute of Architects, 1741 New York Ave., Washington 6, D. C. $5.

Written to meet average conditions required in architectural specifications for fire-resistant and semi-fire-resistant buildings, this volume consists of dummy sheets to be used for working up the rough specification draft for a specific job. Spaces are left for the architect to fill in to conform with his requirements, or he may cross out conditions or insert others. It is intended that the final specification be duplicated from this rough draft, which is then thrown away or filed, and a new set of work sheets be used for the next job.

Among the advantages claimed for this system are savings in time and labor, by keeping research to a minimum and eliminating the need for retyping. Actual writing of specifications can be delayed until the working drawings are practically completed and most of the decisions on details settled. Thus, many disagreements between drawings and specifications due to late changes in the former may be avoided. And by always working with the same basic document, the architect will prevent reference to peculiar conditions of one job from getting into the specifications of another.

New Engineering Book

THE BASING-POINT SYSTEM—By Fritz Machlup. 275 pp. The Blakiston Company, 1012 Walnut St., Philadelphia 5, Pa., and Toronto 2, Canada. $5.

NUMERICAL CALCULUS—By William Edmund Milne. 393 pp. Princeton University Press, Princeton, N. J. $3.75.

DESIGN OF STEEL BUILDINGS—Third Edition—By Harold D. Hauf and Henry A. Pfisterer. 280 pp. John Wiley & Sons, New York; Chapman & Hall, London. $5.

MANUAL OF STRUCTURAL DESIGN—Third Edition—By Jack Singleton. 336 pp. H. M. Ives & Sons, Topeka, Kan. $6.

ZONING LAW AND PRACTICE—By E. C. Yokley. 514 pp. The Michie Co., Charlottesville, Va. $12.

AN INTRODUCTION TO ENGINEERING ECONOMICS—By C. R. Young. 160 pp. The University of Toronto Press, Toronto, Ontario, Canada. $3.

LABOR IN THE AMERICAN ECONOMY—By William Stephen Hopkins. 368 pp. McGraw-Hill Book Co., New York 18, and London. $3.50.

ELEMENTARY STRUCTURAL PROBLEMS IN STEEL AND TIMBER—Third Edition—By C. R. Young, and C. F. Morrison. 329 pp. John Wiley & Sons, New York; Chapman & Hall, London. $4.50.

1947 PROCEEDINGS AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—American Association of State Highway Officials, 1220 National Press Building, Washington 4, D. C. $3.

PROCEEDINGS OF THE FEDERAL INTER-AGENCY SEDIMENTATION CONFERENCE—Prepared by the Bureau of Reclamation, U. S Department of the Interior, Washington, D. C.

SPECIFICATION WORK SHEETS—By Ben H. Dyer. 198 pp. The American Institute of Architects, 1741 New York Ave., Washington 6, D. C. $5.

STRUCTURAL PRECAST REINFORCED CONCRETE — Second Edition — By Kurt Billig. 91 pp. F. Fritz Billig, Jamaica 3, N. Y. $6.

"Give us the tools . . ."

Now is the time to *FIGHT SOCIALISM* in Washington

Do we want to follow Britain down the economic skids?

We Americans face that question today. For we are being advised by Administration economists in Washington to take the course which destroyed Britain industrially. It is the temporarily easy course of cutting down expenditures for tools in order to have more things to consume right away.

The President's Council of Economic Advisers tells us we are spending too large a part of our national income on new tools and equipment. A larger share, they say, should go for goods and services used directly by consumers.

Before we take that advice, let us look at Britain. When the British once allowed their industrial plants and equipment to run down – they started down a dreary road to industrial stagnation and decay.

British industry once ruled the world. Low production costs enabled it to undersell all competitors. Efficiency gave British workers the highest living standards anywhere.

Now all that Britain has between it and economic disaster is pluck and American aid through the Marshall Plan.

The British people are living poorly – still on rations and in austerity. With practically everyone working, and working longer hours than we do in the United States, they cannot produce enough to pay for the raw materials and food they must import.

How did Britain get in this fix?

The story is complicated. British sacrifices in two wars play a tragic part in it. But another fact also stands out:

Britain began to go downhill even before World War I – when British industries allowed their plants and equipment to grow obsolete.

Once that process started, it grew steadily worse. By 1929 the share of Britain's national income being plowed back into capital investment had shrunk to less than two-thirds of what it had been twenty years earlier. We were putting twice as big a share of our national income into capital goods at this same time.

Skimping on capital equipment – on new plants and new tools – put the skids under industrial Britain.

World War II only speeded up a process already well under way.

continued on next page

British industry today shows the results of its failure to keep up to date. Here are three examples found by Dr. Laci Rostas, Britain's leading authority on measuring workers' productivity:

An American produces *four* times as much pig iron as his British counterpart.

He produces *more than four times* as many tires.

In all industry, on the average, an American produces almost three times as much.

The real reason is the American's better tools. The British are struggling with equipment that is, on the average, forty years old.

Britain once had a big head start in industrial equipment. But she let it slip away. And as it went, Britain's industrial and political leadership slipped with it.

How could British leaders have slept while all this happened?

This, too, is a complicated story. But parts of it stand out clearly:

1. *British business men put in more time perfecting cartels to avoid competition than they did in improving their plants and equipment to meet it.*

2. *British labor leaders concentrated on sharing the work and sharing the wealth—rather than doing the job necessary to have enough wealth to make the sharing worthwhile.*

3. *British governments taxed away the means to buy new equipment. By steadily increasing personal taxes, they undercut the* ability *of individuals to invest in new equipment. Finally, they took away the* incentive *to get new equipment by progressively taxing away any returns on it.*

4. *Farseeing socialists smiled all the while, knowing that as private industry more and more lacked the tools to do a progressive job, they would have their chance to run the country.*

Now, with Britain's fate in their hands, the socialists are trying desperately to stem the nation's economic decline by rebuilding its industrial plants and equipment.

They are making a little headway, but not enough. There are several reasons. One is that Britain must export most of the new equipment she can make. *Another major reason—increasingly important for her future—is that money needed to renovate Britain's run-down industry is taxed away to support welfare programs.* The (London) *Economist* grimly puts it this way:

"The importance of the function of saving has only been discovered now that the means of saving have largely been destroyed."

Our own Federal and State governments, too, have dangerously whittled away incentives. They have more than tripled tax rates on personal and corporation incomes in the last twenty years. Now, the President proposes to do more whittling.

If the United States is not to go Britain's way, we must preserve our incentives to save and to invest in industry.

If the United States is to progress, we must continue to build up our industries.

The President's Economic Advisers say we can slow down. But the McGraw-Hill survey of "Business' Needs for New Plants and Equipment," reported in the previous editorial in this series, produced facts to the contrary. It showed that industry *now* plans—*if it can get the money*—to spend $55 billion in the next five years for new plants and new tools. Moreover, it showed *industry's needs* for new facilities are large.

By cutting down the incentives to save, by giving soothing advice that we do not need to save so much, Washington is pushing us toward Britain's way—the route via industrial stagnation to socialization.

Before we skid too far, we should pull up short and ask ourselves: Do we want to go Britain's socialistic way?

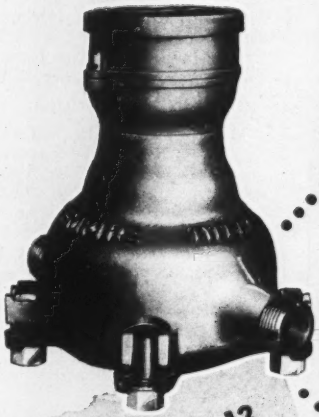
There still is time to say, "No."

A complete report on our national survey, "Business' Needs for New Plants and Equipment," may be obtained by writing McGraw-Hill Publishing Co., 330 West 42nd St., New York 18, N. Y. This is the fifth editorial of a special series on industry's needs for new plants and equipment.

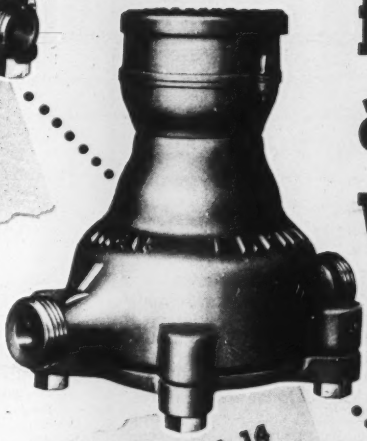
James H. McGraw, Jr.

President, McGraw-Hill Publishing Company, Inc.

How EMPIRE OSCILLATING PISTON METERS cut friction and wear!

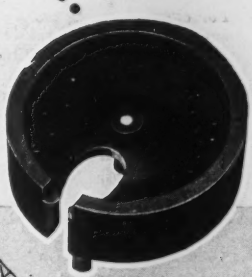


EMPIRE TYPE 12
Frost proof model for cold climates. Described in Bulletin W-802.



EMPIRE TYPE 14
Bronze bottom plate model for warm climates. Described in Bulletin W-801.

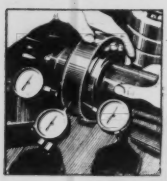
Empire meters alone enjoy the design advantage of a *balanced* oscillating piston. This piston glides with a circular motion; smoothly, silently between the mirror smooth faces of a snap-joint measuring chamber. Since the piston web is centered to balance water pressure from above and below it . . . and because of its featherweight, the Empire piston practically floats. This exclusive construction holds friction and wear to a minimum—results in a super-sensitive meter that measures large and small flows alike with precision accuracy over the longest periods of time.



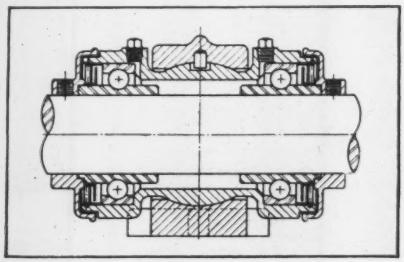
THE PISTON THAT *Glides*
FOR GREATER ACCURACY
LONGER LIFE

ROCKWELL

PITTSBURGH EQUITABLE METER DIVISION
ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PA.
Atlanta Boston Chicago Houston Kansas City Los Angeles
New York Pittsburgh San Francisco Seattle Tulsa



with BALL BEARINGS
— the small extra first cost of test samples pays off in assurance of efficiency and durability of the finished mechanism.



with TRACING CLOTH . . .

The small extra first cost of Arkwright Tracing Cloth, over that of tracing paper, repays many times over in the efficiency and durability of valuable drawings.

Through continued research and development plus skilled manufacturing processes, Arkwright Tracing Cloths meet every requirement of exacting draftsmanship. You'll find no pinholes, stains or other imperfections to detract from drawing quality — nor smudging or feathering after repeated erasures. Most of all, you'll have highly transparent, long lasting usefulness that perishable tracing paper can never match.

For every drawing worth keeping for future use — specify permanent Arkwright Tracing Cloth. Send now for generous working samples. Sold by leading drawing material dealers everywhere. Arkwright Finishing Company, Providence, R. I.

The Big Six Reasons Why Arkwright Tracing Cloths Excel

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ARKWRIGHT
TRACING CLOTHS
AMERICA'S STANDARD FOR OVER 25 YEARS

Also Recorded

Tight Squeeze—A power shovel operator in East Hartford, Conn., miscalculated by only one inch but that mistake was enough to cause him considerable bodily injury and to jam traffic for quite a while. He tried to drive his equipment, which was 14 ft. 5 in. high through a New Haven RR underpass with a clearance of 14 ft. 4 in.

Maneuver Ability—In Omaha, Neb., the head of the parking department is quoted as saying, "We're making our new parking spaces 22 ft. long, but even that isn't enough," and he added, rather ungallantly, perhaps, "The average woman driver needs 40 ft. to get into a parallel parking space."

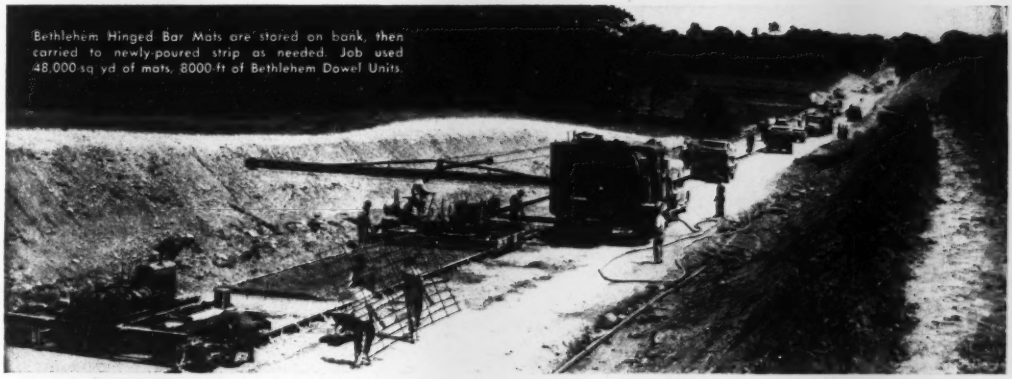
Painless Bill Paying—City Manager Henry A. Yancy of Charlotte, N. C., has a plan in mind to make it easier for citizens to pay their bills to the city when the municipal offices aren't open. A slot-in-the-wall device will be installed beside the front door of the city hall. Envelopes will be available in another container, and the forgetful citizen can just drop his money into the envelope along with a slip also provided on which is to be written what the payment is for. Receipts will be mailed later.

Law of Compensation—Many thousands of citizens in Columbus, Ohio, had to get along with less water for a couple of days recently when an important water main broke. But the water, gushing from the broken main, drew in air from faucets and sent water meters spinning backward, so consumers' water bills may be reduced automatically.

Lines Weren't Busy—An industrious citizen of New Castle, Pa., digging a ditch in front of his home struck what he thought was an inbedded timber. He took a saw and cut it through—no small task since it was a 600-pair telephone cable.

Business Picking Up—"Our business is picking up" is the slogan of 14 vets in Milwaukee, Wis., who have organized Trash Collections, Inc., to service establishments not eligible for free city refuse pick-ups.

Lost Road—The Old River Road, one of the oldest streets in Concord, N. H., has been drowned. City engineers recommended that the street be removed from the city records after they discovered it has disappeared beneath the Merrimack River during the last 150 years of floods and shifting river currents.



Bethlehem Hinged Bar Mats are stored on bank, then carried to newly-poured strip as needed. Job used 48,000 sq yd of mats, 8000 ft of Bethlehem Dowel Units.

3 Miles of New Road on U.S. 322

Mapping out the day's operations. Left to right: William Berlanti, contractor; Harold V. Runner, resident engineer, and W. Ralph Eccles, district construction engineer, both of Pa. Dept. of Highways; and Eugene Kohles, carpenter foreman.

In order to provide a better, safer road for the heavy volume of traffic using U.S. 322 between Chester and Concordville, Pa., the Pennsylvania Department of Highways recently called for three miles of relocation in the Concordville area. The new road is virtually free of turns, and its construction included the erection of four bridges and three culverts. Contractor for the project: Berlanti Construction Co., of Harrison, N. Y. The bridge reinforcing, as well as bar mats and dowel units, were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Guard Rail Posts
Bar Mats • Guard Rail • Wire Rope and Strand
Hollow Drill Steel • Spikes • Bolts and Nuts • Pipe
Sheet- and H-Piling • Fabricated Structural Steel
Timber Bridge Hardware • Tie-Rods

BETHLEHEM STEEL

Trucks are loaded fast in this well-equipped batching plant adjacent to new road. Note stockpile of Bethlehem Bar Mats at left.

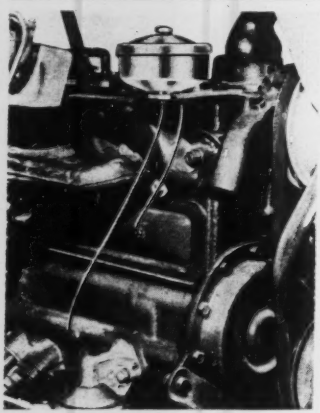
Form setters and fine-grading crew have a job on their hands keeping ahead of the fast-moving paver shown near brow of hill.

One of four bridges in the making. With Bethlehem Reinforcing Bars in place and securely tied, pouring of deck gets under way.

NEW PRODUCTS

King Size Hauling

This huge Sterling motor truck will haul a payload of 22 tons. It features dual chain drive, power steering, 275 hp. super-charged diesel engine, and a 17 cu.yd. rock body.—STERLING MOTORS CORP., MILWAUKEE 1, WIS.



Lifetime Oil Filter

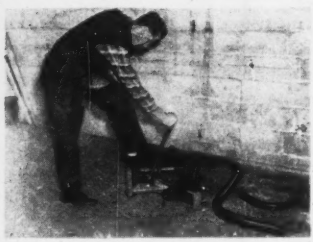
An oil filter with a permanent non-clogging element is now available to motorists and fleet owners. Filterall is guaranteed not to wear out or to require replacement of any parts. When the element becomes dirty it is necessary only to dip it in gasoline and replace it, a two- or three-minute operation. It filters 100 percent of the oil that passes through it.—FILTERALL FILTERS CO., 440 SEATON ST., LOS ANGELES 13, CALIF.

Concrete Floor Paint

An unusual rubber base interior enamel may be used safely for painting basement floors and other concrete floors on or below grade, so long as no hydrostatic pressure exists. Its durable finish is said to resist acids, alkalies, soaps, oil, grease and alcohol, and offers good abrasive resistance.—THE TREMCO MFG. CO., 8701 KINSMAN ROAD, CLEVELAND, OHIO.

Anti-corrosion Cement

A new thermosetting resin is used as a corrosion-resisting repair cement. It is called "carbo-mix". It has anti-corrosion, sealing and adhesive powers that should give it an unusually wide range of application.—CARBOLINE CO., 7603 FORSYTHE BLVD., ST. LOUIS 5, MO.

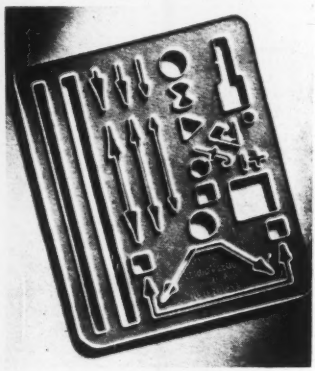


Portable Pipe Bender

Weight of jack and frame of hydraulically operated unit is only 83 lb. Jack is readily removable from frame and can be used for other purposes. Device bends standard pipe and conduit in sizes from ¾ to 2½ in. The 30-in. steel frame is electrically welded and heavily reinforced. Unit includes ¾-, 1-, 1¼-, 2-, and 2½-in. dies. Bender is called "Lightweight Champ."—ELECTRIC CORD CO., 30 CHURCH ST., NEW YORK 7, N. Y.

Wedge-slot Screen

New screen types and methods of assembly on stationary, revolving and vibrating equipment have been developed for a Wedge-Slot screen, which has a continuous slot for its entire length, with tapered profile bars assembled with U-shaped holders. In addition to flat-topped profiles, there is now being made a screen with parabolic head flanges for dewatering and screening out wet undersize material and impurities. Other new types include screens with very small bars to provide greater open area screens with heavy bars, with protecting head flanges, to resist abrasion; and special screens for pulverizers, centrifugals, dryers, vacuum and pressure filters, filter presses, vibrators, and conveyors. —HENDRICK MFG. CO., CARBONDALE, PA.



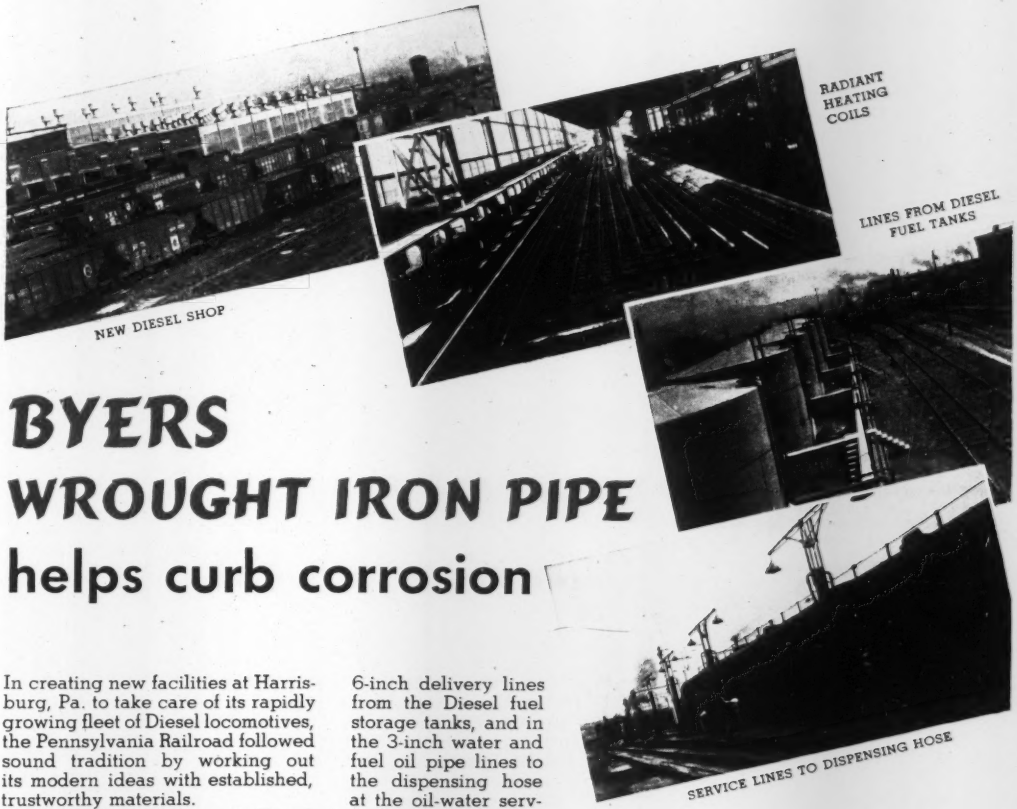
Dimensioner Template

The new No. 60 Dimensioner template speeds up the dimensioning and lettering of drawings, and makes standard drafting symbols easily, and accurately. It aids uniformity. All symbols and sizes conform to standard drafting room practice. The dimensioner is made of .040 super-quality cellulose nitrate. Beveled cutout of symbols are precision milled. Size 4 in. x 3¾ in.—RAPIDESIGN, INC., P. O. BOX 592, GLENDALE, CALIF.

Metal Primer

To eliminate the necessity of having to remove all rust or to have the surface perfectly dry before painting, a combination chemical pre-treatment and primer for metal is offered in Rust-O-Primer. A vinyl base quick drying wet primer applicable over wet or dry, clean or rusted metal including steel, aluminum or galvanizing, its purpose is to provide a hard, paintable foundation for any type of paint.—THE WILBUR & WILLIAMS CO., GREENLEAF AND LEON STREETS, BOSTON 15, MASS.

In the Pennsylvania Railroad's new facilities for diesel servicing—



BYERS WROUGHT IRON PIPE helps curb corrosion

In creating new facilities at Harrisburg, Pa. to take care of its rapidly growing fleet of Diesel locomotives, the Pennsylvania Railroad followed sound tradition by working out its modern ideas with established, trustworthy materials.

The 198-ft. x 266-ft. main Diesel repair shop, like all engine houses, represented a difficult heating problem, because of the eight large doors. The unusual results obtained from radiant heating in structures like hangars and garages, where parallel conditions are encountered, led the engineers to install radiant heating to carry a substantial portion of the heating load. Byers Wrought Iron 1¼-inch pipe, spaced on 10-inch centers, was embedded in the concrete floor of each platform. Radiant heating with Byers Wrought Iron pipe was also used in an attached building housing a machine shop, cleaning room, offices and storerooms.

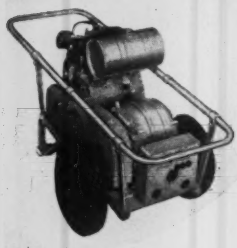
Byers Wrought Iron pipe was likewise installed in the 4-inch and 6-inch delivery lines from the Diesel fuel storage tanks, and in the 3-inch water and fuel oil pipe lines to the dispensing hose at the oil-water servicing station.

The time-proven corrosion resistance of Byers Wrought Iron pipe, that recommends its use for responsible services like these, comes from the unique character of the material. Tiny fibers of glass-like silicate slag, threaded through a body of high-purity iron, halt and "detour" corrosive attack, and so discourage pitting and premature failure. The fibers also anchor the initial protective scale, which shields the underlying metal. Our booklet, "The ABC's of Wrought Iron", gives details. Ask for a copy.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N. Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

Power plant furnished with unit: 1.25 KVA, generates both single and 3-phase 60 cycle AC. Also suitable for operating lights, vibrators, tools, etc.



JACKSON
MUNICIPAL PAVING UNIT

PLACES PERFECTLY UPWARDS OF 65 Cu. Yds. OF STIFF MIX CONCRETE PER HOUR

- Will undercut at the side forms • strike off crowns, both regular and inverted • roll back for second passes.
- Thoroughly vibrates concrete in slab depths up to 10" and is quickly adaptable to any slab width from 6' up to any practicable width.
- Works right up to and around sewers, manholes and other obstructions.
- Screed has strong tendency to propel itself in forward direction. Little effort required. Operators work from front, rear or sides.

Take the first step towards landing more municipal paving jobs and handling them at a greater profit. Write for the complete facts, NOW.

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Mich.

Important TO HEALTH AND EFFICIENCY

COOL, PURE DRINKING WATER ...ON THE JOB

Dobbins Portable Sanitary Drinking Fountain

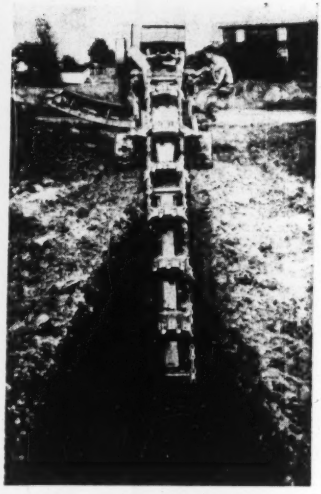
Assures an adequate supply of cool, pure drinking water for workers *everywhere*—in factory or field. Protects their health, and keeps them on the job. Fountain has inner water container of stainless steel. Four gallon tank is fully insulated. Constant air pressure for instant flow of water is furnished by a few strokes of the pump at widely spaced intervals. *Operates at the press of a button*, like any bubbler drinking fountain. May be easily carried from place to place by shoulder strap, or mounted on truck, tractor or locomotive.

Banishes germ-spreading cups, dippers, pails.

DOBBINS MANUFACTURING CO.
DEPARTMENT 353 ELKHART, INDIANA

Dobbins Superbilt PORTABLE DRINKING FOUNTAIN

WRITE TODAY FOR FREE DESCRIPTIVE FOLDER



New Buckeye Ditcher

Buckeye 406 general utility ditcher is now in full production. All of welded box section boom telescopes; lower section nests in upper section for 6 ft. digging depth. Fully-extended boom digs to 8 ft. Diagonal boom affords faster penetration in starting a cut and provides undercutting of walks and drives. Boom is raised and lowered by hydraulic power. Road speeds up to 3.38 mph. Digs forward or reverse. Mounted on a standard Alligator Crawler unit.—GAR WOOD INDUSTRIES, INC., FINDLAY, OHIO.

Aluminum Interior Trim

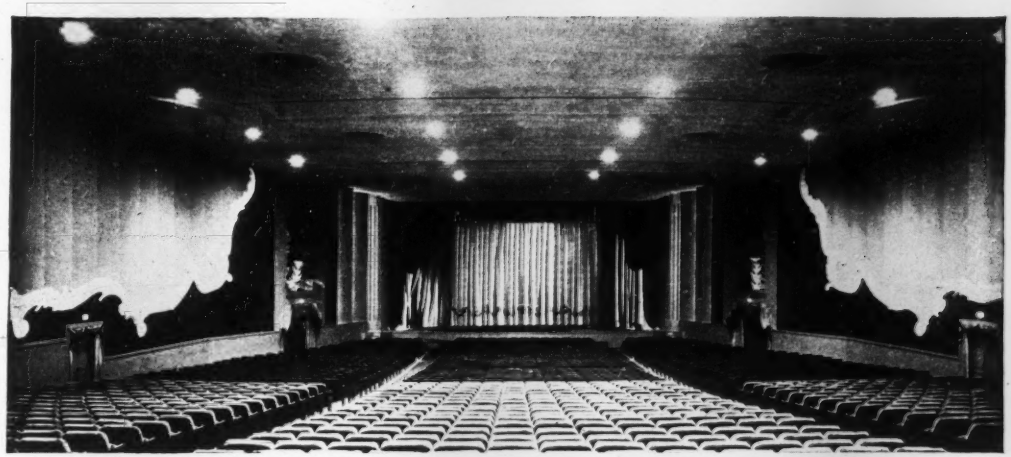
At is claimed for "Altrico" aluminum alloy door frames, baseboard and window trim that they are easily installed, are fireproof, sanitary, and economical because they can be installed as soon as the structure is roughed in—no waiting for door frames, or for plaster to dry in order to finish the trim.—ALLOY TRIM, INC., 2937 SEYBORN AVE., DETROIT 14, MICH.

Diesel Engine Lubricant

A new diesel engine lubricant, designed to counteract the harmful effect of high sulfur fuels, has been developed by a manufacturer who specializes in heavy-duty lubrication problems.—D-A LUBRICANT CO., INC., INDIANAPOLIS, IND.

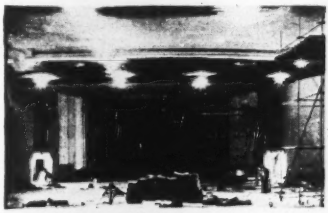
Drag Clamp

Gripping clamp has one-piece jaw frame mounted on heavy shoe which acts as a skid for easy movement of cumbersome sheets, plates and flat stock. Sheet slipped between jaws of clamp is automatically gripped.—MERRILL BROS., ARNOLD AVE., MASPETH, N. Y.

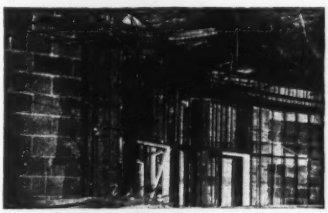


A Modern Masterpiece

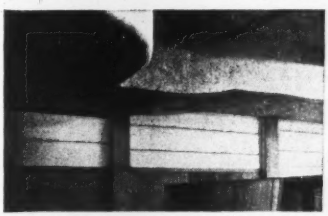
in architectural design and acoustical engineering . . .
achieved with the aid of Truscon Diamond Lath and Cold Rolled Channels



Truscon Metal Lath suspended ceiling partially covered with sprayed asbestos.



Construction details of Truscon Metal Lath ceiling and Cold Rolled Channel furring.



Heating ducts and beam with Truscon Steel Lath base, covered with sprayed asbestos.

● The Fairview Village Shopping Center, located in suburban Cleveland, is a new business development consisting of 40 stores of varying sizes, bowling center, and theatre.

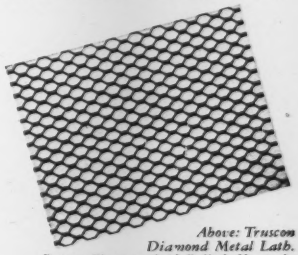
In the bowling center and theatre, Truscon Diamond Metal Lath and sprayed asbestos were used in ceiling construction to attain a high degree of sound deadening and non-echoing. Truscon Diamond Lath and plaster furred construction were used in the theatre foyer. Truscon Cold Rolled Channels were used extensively to give rigid, fire-resistant construction.

Truscon Diamond Lath is a flat metal lath, uniformly expanded throughout the entire sheet. Its use is almost universal, for it is adaptable for practically all classes of work—as a base for walls, partitions, ceilings, as a reinforcement for stucco, as a protection for steel beams and columns, and for protecting hazardous points in wood frame construction.

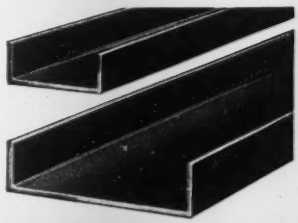
Truscon Cold Rolled Channels are strong, straight and true metal members, with square corners that prevent rolling.

Write for free descriptive catalog showing the entire line of Truscon Metal Lath and Accessory Products, to help you develop modern construction masterpieces.

TRUSCON STEEL COMPANY
YOUNGSTOWN 1, OHIO
Subsidiary of Republic Steel Corporation



Above: Truscon Diamond Metal Lath.
Below: Truscon Cold Rolled Channels.



Construction details for Truscon Metal Lath and plaster center recession.

KWIK-MIX

Moto-Bug

MAKES

MAN-HOURS 3 to 4 TIMES

more productive

In soft, muddy-going, Moto-Bug's low-pressure, 16 x 5.00 tires on front drive wheels provide plenty of traction and flotation. Dual rear steering wheels are free-riding on axle . . . have a differential action for easy turning at a touch of the steering lever.

● Now you can cut the high costs and hard work out of materials-handling . . . make man-hours 3 to 4 times more productive, with Kwik-Mix *fully-powered* Moto-Bug. It hauls bigger, heavier loads each trip . . . has 10 cu. ft. capacity bucket for bulk-materials . . . handles up to 1200 lbs. as a flat-bed truck. And . . . you get more loads per hour because Moto-Bug eliminates slow-going manual labor, cuts fatigue. There's no end-of-day slow-down.

MAKE IT EASIER TO GET... AND KEEP WORKERS

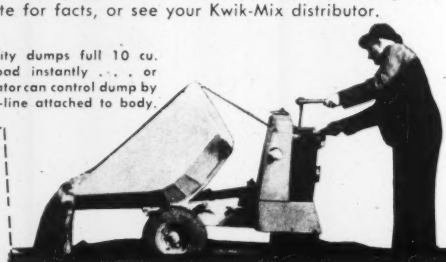
Moto-Bug takes *all* the pushing and pulling out of traveling and spotting. No manual effort is required to back up . . . Moto-Bug moves by power both forward *and* reverse at speeds from 1½ to 4 m.p.h. Riding step is available to further reduce operator fatigue.

YOU ALSO GET:

Positive steer . . . hand lever is connected *direct* to dual rear steering wheels. Handy 33" width . . . clears narrow doorways, aisles, turns in own length. Controlled gravity dump . . . lets operator dump part of a load, or spread, by means of a handy bucket-control rope. *Standard-make* gasoline engine, 4 h.p., air-cooled, 4-cycle type.

Only Kwik-Mix Moto-Bug gives you *all* these time and labor-saving features for more production, more profits. Write for facts, or see your Kwik-Mix distributor.

Gravity dumps full 10 cu. ft. load instantly . . . or operator can control dump by snub-line attached to body.



CKM904

MAIL TODAY TO

KWIK-MIX Co., Dept. EN, Port Washington, Wis.

Please send Moto-Bug data: ☐ Specs. ☐ Prices

NAME .....

TITLE .....

COMPANY .....

STREET ..... STATE .....

CITY .....

TYPE OF BUSINESS .....

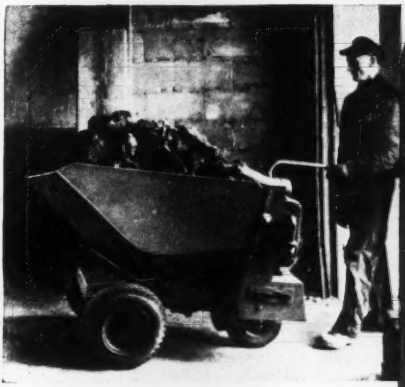
Also send information on the following Kwik-Mix Mixers:

☐ 3½-S ☐ 6-S ☐ 11-S ☐ 16-S Concrete Mixers

☐ No. 10 ☐ No. 14 Bituminous Mixers

☐ 6-P Plaster Mortar

KWIK-MIX

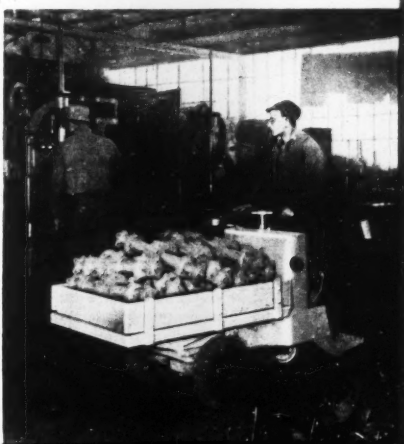


HAULS UP 20% GRADES

Moto-Bug's 4 h.p. takes full loads up 20% grades, loading ramps, over rough-going . . . moves more material faster around factories, foundries, stockrooms, construction jobs . . . keeps production up.

STURDY "X" PLATFORM CARRIES OVER ½ TON

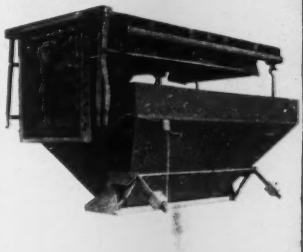
Flat-bed, interchangeable with 10 cu. ft. bucket, carries up to 1200 lbs. . . . has stake pockets for adding side boards. Operator rides on back step . . . has handy steering lever for spotting . . . reverse power for back-up.



COMPANY
Port Washington, Wisconsin

ACCURATE . . . "HI-SPEED" ROADBUILDERS' Batcher

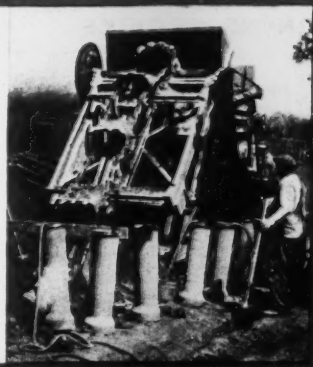
Johnson Roadbuilders' Batchers are completely portable . . . adaptable to fit similar bins . . . provide accurate control . . . produce top-quality concrete with utmost economy of materials. Handle 2, 3 or 4 aggregates in sizes for 34-E paver batch or 2, 3 or 4 yd. batch for charging transit mix trucks. Other Johnson sizes, types to fit production problems of any plant.



C. S. JOHNSON COMPANY
Champaign, Ill.
Koehring Subsidiary

310 TRENCHLINER* digs 15' deep, up to 54" wide

For your heaviest sewer, gas and water-main excavation, check this heavy-duty Parsons 310 Trenchliner. Digs to 15' deep . . . 54" wide . . . has 45 digging speeds from 8" to 186" per minute. Boom is telescopic, easily adjusted for digging depths . . . shifts to cut within 15" of either side of machine. Power shifts the arc-type spoil conveyor. 4 smaller Trenchliners also available.

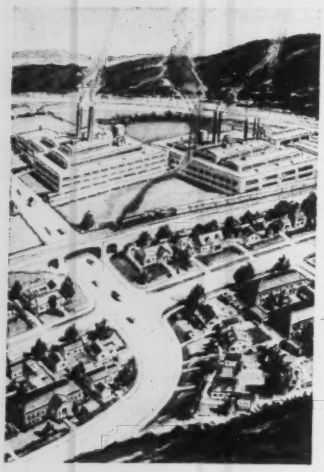


PARSONS COMPANY
Newton, Iowa

HALF-YARD 205 has self-adjusted clutches

With Koehring ½-yard 205, there's no time-out for daily manual clutch adjustments . . . no "compromise" settings. You get top operating efficiency from start to end of shift because heat-compensator springs on the 205's six main clutches make all tension changes automatically. That's only one of many ways this heavy-duty 205 gives you more work-time . . . bigger daily output. It will pay you to get all the facts on the 205.

KOEHRING



LONGER SERVICE

At Lowest Cost

FACTORIES, processing plants, railroads, etc., the Nation over are buying more and more Layne Well Water Systems and Layne Vertical Turbine Pumps. Here is well water producing equipment that meets every requirement for sustained high efficiency, dependable long life and welcomed economy in operation cost.

Layne well water producing equipment has always been designed and built to outlast any other made. The use of finest materials throughout, plus rugged strength and manufacturing craftsmanship practically eliminates breakdowns and costly repairs.

The production from Layne Well Water Systems is often double and sometimes triple that of conventional type wells and pumps. In some cases one Layne Well Water System produces enough water to replace several less efficient systems. The savings thus enjoyed, have made the change very profitable.

COMPLETE INSTALLATIONS

Complete installations by Layne include everything from preliminary survey, exploration, well drilling, pumps and pump installation, delivering the system ready for service, fully tested and operation. For further information, catalogs, bulletins, etc., address LAYNE & BOWLER, INC., General Offices, Memphis 8, Tenn.

LAYNE

WELL WATER SYSTEMS

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. • Layne-Atlantic Co., Norfolk, Va. • Layne-Central Co., Memphis, Tenn. • Layne-Northern Co., Mishawaka, Ind. • Layne-Louisiana Co., Lake Charles, La. • Louisiana Well Co., Monroe, La. • Layne-New York Co., New York City • Layne-Northwest Co., Milwaukee, Wis. • Layne-Ohio Co., Columbus, Ohio • Layne-Pacific, Inc., Seattle, Wash. • Layne-Texas Co., Houston, Texas • Layne-Western Co., Kansas City, Mo. • Layne-Minnesota Co., Minneapolis, Minn. • International Water Corporation, Pittsburgh, Pa. • International Water Supply, Ltd., London, Ont., Can. • Layne-Hispano Americana, S. A., Mexico, D. F.

Manufacturers' Publications

Corrosion-Resistant Products—(24-p. booklet) Describes and illustrates 47 classifications of nickel specialties including nails, bolts, slings and hooks, pipe and pipe fittings, gaskets, valves and wire rope. — INTERNATIONAL NICKEL CO., INC., 67 WALL ST., NEW YORK 5, N. Y.

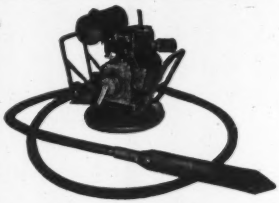
Bulldozing—(12-p. pamphlet covers numerous applications of versatile bulldozer, including grading, heavy digging, backfilling, land clearing and leveling. — CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Self-Loading Truck—Circular describes Model 15 transport rocker shovel, a heavy duty machine for loading, transporting and depositing material without the aid of any auxiliary equipment. In reality it is a self-loading truck. It is also a self-contained unit and may be powered by gasoline engine or by either an AC or DC electric motor. Bucket motion is controlled by a lever between the steering and locomotive levers. It is very maneuverable in tight places.—THE EIMCO CORP., SALT LAKE CITY 8, UTAH.

Bucket Loaders—A 12-page circular gives all the information about the Haiss heavy-duty bucket loaders equipped with integral swivel belt conveyor discharge. Large pictures show the advantages of the various applications of this type of materials loading. —PETTIBONE MULLIKEN CORP., 4700 WEST DIVISION ST., CHICAGO 51, ILL.

Crawler Tractors—In a series of mailing folders, the manufacturer presents design and performance details on four International Diesel crawler tractors—TD-18 of 80.5 drawbar hp., the 57-hp. TD-14, and the TD-9 and TD-6 models of 39 and 29.5 drawbar hp., respectively. Applications of each are spotlighted in job shot illustrations. Sectional views of the tractors reveal engineering construction details developed to increase operational economy and efficiency.—INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVENUE, CHICAGO 1, ILL.

Pipe Supports—Among the items listed in this catalog are channel type and bolt type spacers, beam clamps, angle connectors, slotted conduit hangers, adjustable swinging hanger flanges, roller supports, steel wall brackets, and many other devices for pipes, conduits



Concrete

VIBRATORS

Gasoline Engine or

CONCRETE GRINDERS

Other Products

Electric Motor Driven

FRONT END SHOVELS

for Industrial Tractors

HEATING KETTLES

for Asphalt and Tar

AGGREGATE DRYERS

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ASPHALT PLANTS

Portable—Stationary

Write for Circular

White Mfg. Co.

ELKHART INDIANA

Electroline—FIEGE

WIRE ROPE CONNECTORS

The **LAST WORD** *in*

SAFETY SPEED SAVINGS

No heat, acids or complicated equipment required for installation. Ordinary mechanic's tools do the job, safely, even in chemical plants, powder plants and mines, where other methods would be prohibited. And they are safe to use, because they have the highest holding strength of any known wire rope or strand connectors. They assure *savings in installation* because unskilled labor can do the job easily and quickly; *savings in use* because they prolong wire rope life by damping vibration and overcoming rope fatigue at entrance to fitting . . . and because they are reclaimable.

Note ease of installation

Send for new descriptive catalog

Simply slip the sleeve over the cable, spread the strands, insert and drive in the plug then apply the socket. See what a solid and permanent joint you have by looking at it through the inspection hole put there for the purpose.

Electroline Company

4121 S. LA SALLE ST., CHICAGO 9, ILL.

and tubing.—THE KINDORF CO., 681 MARKET ST., SAN FRANCISCO 5, CALIF.

Solder Selection Guide—A 4-page publication lists sixteen metals that are most frequently soldered, gives their order of solderability, together with recommendations for the best flux core solder or solder and flux suitable to soldering operations, and also for the flux type most desirable when an external flux is used. Other tables list the physical characteristics of the various Alpha solders.—ALPHA METALS, INC., 363 HUDSON AVENUE, BROOKLYN 1, N. Y.

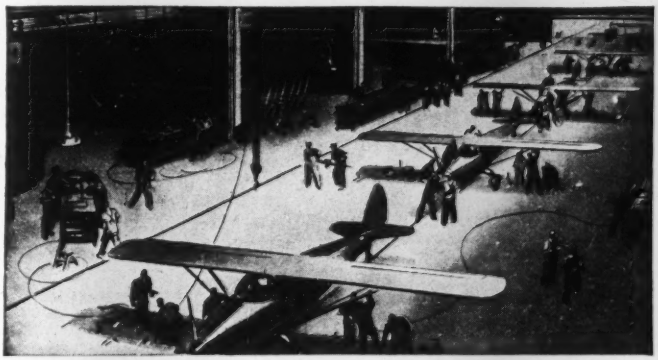
Thermal Insulation—The simplified physics of thermal insulation is discussed in a 32-page manual by Alexander Schwartz. It covers heat transfer, condensation, vermin, mold, five radiant heating, and other factors involved in the study of insulating values. Mr. Schwartz adds to his own findings and extensive research, the reports and discussions of outstanding authorities and laboratories. Although a complete and exhaustive treatment of textbook character, the manual is simply and clearly written and even the most technical subjects have been made easy to grasp. Numerous charts and diagrams give additional information.—INFRA INSULATION, INC., 10 MURRAY ST., NEW YORK.

Braided Wire Rope Slings—Folder shows how perfect balance, greater flexibility, resistance to kinking, better purchase on the load, greater reserve strength, and maximum safety are obtained in Atlas slings because they are braided from right lay and left lay endless ropes. The left lay ropes are braided to the right and the right lay ropes to the left, while all ropes follow a continuous spiral path throughout the whole body length.—MACWHYTE CO., 2940 FOURTEENTH AVE., KENOSHA, WIS.

Hard Facing—A booklet describes the hard facing of mixer arms on concrete and cinder block equipment. It contains new complete information on hard facing procedures plus sketches showing exactly where to hard face the parts. Increased parts life of 4 to 5 times has been reported from users of this equipment when hard faced as described in the booklet.—WALL COLMONOY CORP., 19345 JOHN R, DETROIT 3, MICH.

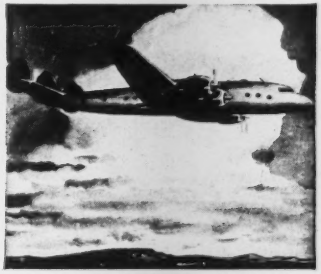
Wall Form Construction—Folder describes the Symons system of wall form construction in which tie rods do not go through the panels but are anchored at the sides. These ties act as spreaders and do away with 75 percent of the customary bracing.—SYMONS CLAMP AND MFG. CO., 4265 W. DIVERSEY DRIVE, CHICAGO, ILL.

Seven new planes completed ...at a cost of $4.30!



New planes can't fly without control cable, and this manufacturer needed some —fast. He got it the same way he regularly gets many supplies and parts—by Air Express. Ordered in A.M., delivered to plant same day. 500 miles, 28 lbs., Air Express charge only $4.30. So production continued without a break.

$4.30 included pick-up and delivery at no extra charge—and receipt for shipment. All this, plus the *world's fastest shipping service.* That's Air Express—used with profit by every business.



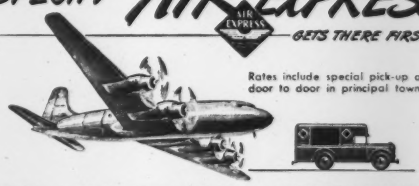
Shipments go on all flights of Scheduled Airlines. Speeds up to 5 miles a minute—no waiting around. Direct service to over 1,000 airport cities, air-rail for 22,000 off-airline offices.

Facts on low Air Express rates:

22 lbs. of new fashions goes 700 miles for $4.73.
6-lb. carton of new jewelry line goes 1,000 miles for $2.24.
Same day delivery in both cases if you *ship early.*

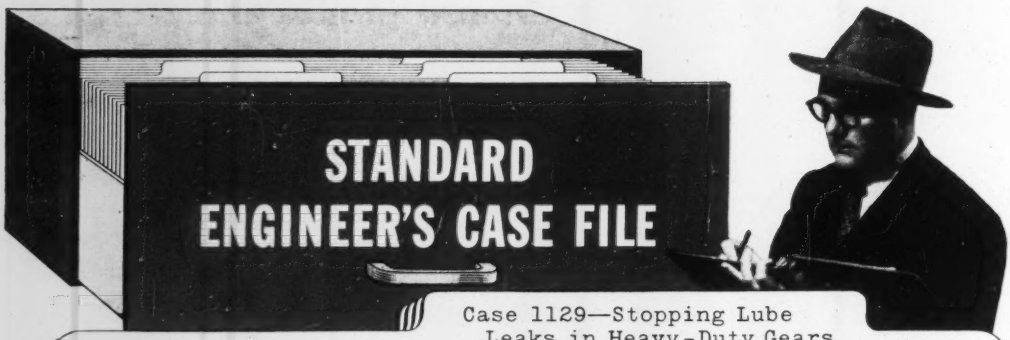
Only Air Express gives you all these advantages: Special pick-up and delivery *at no extra cost. You get a receipt for every shipment* and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to $50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS
GETS THERE FIRST

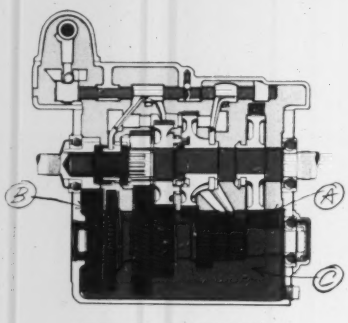


Rates include special pick-up and delivery door to door in principal towns and cities

AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.



Case 1129—Stopping Lube Leaks in Heavy-Duty Gears



HEAVY-DUTY TRANSMISSION

Because compounded RPM Gear Lubricant will not foam, it eliminates a common cause of leakage from gear cases on trucks and other machines working in extreme conditions of temperature and load. Comes in four grades: SAE 80, 90, 140, 250. For spur, spiral and automotive worm gears. (For hypoids, use RPM Multi-Service Gear Lubricant.)

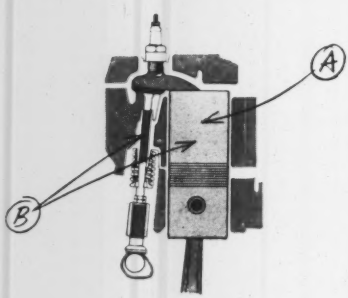
A. Contains foam inhibitor — prevents retention of air whipped into lubricant by rotating gears; breaks bubbles that form.

B. Oiliness compound helps provide tough lubricating film — withstands shock and overloads.

C. High resistance to oxidation prevents deposits; assures lubrication in extreme temperatures.

The stability and high lubricating qualities of RPM Gear Lubricant (Compounded) provide outstanding lubrication for bronze worm gears..

Case 1117—Preventing Starting Wear in Gasoline Engines



GASOLINE ENGINE PISTON AND VALVE

Engines lubricated with RPM Motor Oil had a film of oil on cylinders, valve stems and other parts at all times, even when idle. The film provided lubrication from the instant the engines started to turn over. Recommended for all gasoline engines. Comes in seven grades: SAE 10/10W to SAE 70.

A. Special compound keeps lubricant on hot or cold metal — reduces wear and protects against corrosive moisture in engines.

B. Detergent cleansing agent loosens and removes carbon, gum and lacquer from all parts . . . keeps rings free. Contaminants stay dispersed in the oil and flow out with drainings.

RPM Motor Oil contains other compounds which prevent corrosion of any bearing metal, resist oxidation and stop foaming.

For additional information and the name of your nearest Distributor, write

STANDARD OIL COMPANY OF CALIFORNIA
225 Bush Street, San Francisco 20, California

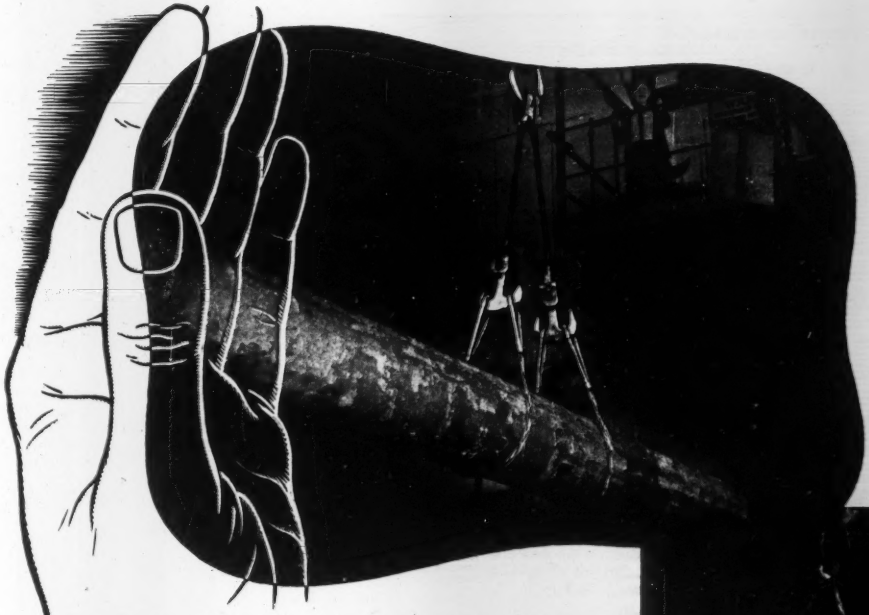
The California Oil Company
Barber, New Jersey

The California Company
17th and Stout Streets, Denver 1, Colo.

Standard Oil Company of Texas
El Paso, Texas

RPM

Trademark Reg.
U.S. Pat. Office



LET 'ER TRAVEL!

Materials move quickly... smoothly . . . carried by flexible YELLOW STRAND *BRAIDED* SLINGS*

When a job's moving on schedule, it's costly to have it slowed by sling equipment. What you want—in factory, shop, warehouse or yard—is *flow* in the handling of sling loads. Yellow Strand *Braided* Safety Slings promote this smoothness. Their flexibility, kink-resistance and light weight enable operators to give each lift more accurate control . . . to run a series of pickups without wasted time or motion.

Patented *braiding* puts added limberness into long-wearing Yellow Strand Wire Rope. The sling conforms to odd shapes, grips curved objects firmly, takes thimbles, turnbuckles and other fittings readily. Weighing less than chain, *braided* slings are easily carried, fastened and detached, using a minimum crew. Employees welcome their security on big tonnage lifts, their Manila-like convenience for small jobs.

Yellow Strand *Braided* Slings are practicable for loads ranging from a 40-lb. drum to a 300-ton locomotive. Send details of your application now and let B&B engineers offer a recommendation.

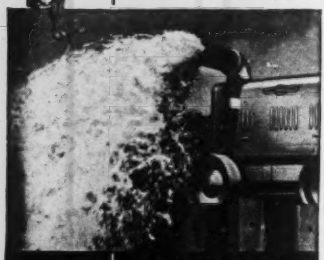
Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* New York, Chicago, Houston, Portland, Seattle. *Factories:* St. Louis, Seattle, Peoria.

RIGGERS' HAND BOOK FREE
Shows sling types, fittings, capacities. Write for your copy.

*PATENTS: U.S., 1475858, 1524611, 2142641, 2162642, 2200108; CANADIAN, 252874, 256[illegible]

BRODERICK & BASCOM
Yellow Strand
***BRAIDED* SAFETY SLINGS**

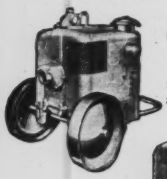
Here's how to handle water—



JAEGER

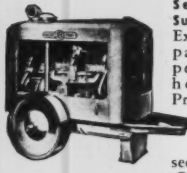
enclosed-type pumps give you steady high efficiency — longer life

To a better engineered, more amply powered, conservatively rated line of pumps, Jaeger has added all-weather protection of all heavy duty models of 2" to 10" size — for sustained efficiency of pump and engine, extra hours of smooth, dependable performance, plus easy accessibility at all times.



2" and 3" Heavy Duty: Most rugged small pumps built. Conservatively rated @ 10,000 and 20,000 g.p.h.

4" to 10" Portables: Compact, extra powerful units of 40,000 to 240,000 g.p.h. rating and exceptional air capacity.



Self-Priming Super-Jet Pump: Extremely compact, yet outperforms old, heavy types. Pressures to 250 lbs.; 90 h.p. engine. Only 30 seconds to prime @ 20 ft.

Only Jaeger Offers All These

Inherent priming action plus "jet" priming — doubly sure and fast . . . long-life "Lubri-Seal," accessible for inspection . . . self-cleaning shell design . . . replaceable liners or seal rings . . . Every pump tested and certified for performance.

Sold, Serviced in 128 Cities

THE JAEGER MACHINE CO.

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1504 Widener Bldg. PHILADELPHIA 7, PA. 226 N. La Salle St. CHICAGO 1, ILL.
235 American Life Bldg., BIRMINGHAM 1, ALA.

Manufacturers' Activities

Sales—Richard M. Scanlon is vice-president in charge of sales for the LITHOGEN CORP. and PRIMA PRODUCTS—protective coatings . . . Wm. J. Crawford is manager of dealer sales for the building products division of the building products division of the GREAT LAKES CARBON CORP. . . . Fred M. Carothers is district sales engineer at Meadville, Pa., for the HIGHWAY EQUIPMENT Co. of Pittsburgh . . . Geo. B. Parker of Chicago has been made assistant sales organization counsel for the U. S. STEEL CORP. of Delaware . . . James F. Moore is sales engineer at Chicago for the BLACK & DECKER MFG. Co. of Towson, Md. . . . O. B. Wilson is manager of sales for the east, southeast and central regions for BROWN INSTRUMENTS division of MINNEAPOLIS-HONEYWELL REGULATOR Co. W. W. Mattack is industrial manager of the New York City branch; D. W. Dryback is district manager at Albany, N. Y., and D. Lyle Russell at Hartford, Conn. . . . C. S. Barnum is sales manager of the Detroit district; Robt. F. Black heads the Cleveland sales office; and Thos. A. Johnson is Cincinnati district manager for PERMANENTE PRODUCTS Co. . . . Chester F. Conner is manager of the industrial products sales department of the industrial and general products division of THE B. F. GOODRICH Co. . . . For the AMERICAN COACH & BODY Co., Cleveland, Ohio, Paul V. Dimmic succeeds Deming Bronson as central division sales manager at Cleveland, with Arthur C. Frank, as assistant . . . Clarence R. Studer is district sales engineer at the new St. Louis office of CHAIN BELT Co. of Milwaukee, Wis., at 8,001 Clayton Road; David B. Hill will direct the new office at Jacksonville, Fla., 340 W. Church St. . . . John I. Dean is executive assistant to J. A. Proven, general sales manager of the PORTER-CABLE MACHINE Co., Syracuse, N. Y.; and R. J. Shanahan is mid-west zone sales manager . . . W. J. Moran is district manager at 527 Park Ave., New Orleans, La., for the heavy machine division of NORDBERG MFG. Co., Milwaukee, Wis. . . . Jas. R. Derrick is assistant sales manager of the PENNSYLVANIA FLEXIBLE METALLIC TUBING Co. . . . Philip E. Jackson is zone sales representative for the Middle Atlantic division of the Detroit diesel engine division of GENERAL MOTORS CORP. A. W. Anderson takes over sales in the south central territory previously covered by Mr. Jackson . . . Derrick L. Brewster is an assistant district sales manager for the INLAND STEEL Co. . . . M. H. Freedman has been appointed division manager of the Pacific Northwest division of COLUMBIA STEEL Co. The newly created sales division comprises Washington, Oregon and northern Idaho. C. C. Johns is manager of sales at Portland, Ore., and Ralph Winship at Seattle . . . Elmer J. Haines is sales representative for N. Y. State, exclusive of N. Y. City, for GENERAL SWITCH CORP., Brooklyn, N. Y. . . . J. H. Heintz is manager of sales for a new line of self-priming centrifugal and other pumps for the McGOWAN pump division of the LEYMAN MFG. CORP., 58 Central Ave., Cincinnati 2, Ohio.

Distributors—STATE EQUIPMENT Co., Harrisburg and Kingston, Pa., has been appointed distributor for BUCYRUS-ERIE excavators and hydrocranes in east-central Pennsylvania.

Personalities—Wm. E. Gahl is chief engineer of TEMPLETON, KENLY & Co., Chicago, Simplex jacks . . . David Larkes has been elected president of the WIRE ROPE INSTITUTE, succeeding E. C. Low, now chairman . . . L. E. Zender is public relations director of the AMERICAN STEEL & WIRE Co., succeeding Wm. I. Ong, named assistant to the president . . . W. R. Wiescheadorff is district manager of the DEARBORN CHEMICAL Co., Chicago, at 807 Mateo St., Los Angeles, Calif. . . . R. C. Ferguson has been made north central district manager of HARDINGE Co., INC., York, Pa., at 8th Ave., East and Howard St., Hibbing, Minn. . . . M. W. Reed has been appointed engineering vice-president of the U. S. STEEL Co. OF DELAWARE to succeed B. H. Lawrence, retired after 44 years . . . Frank H. Stohr is the new general manager of the Norwood Works of the ALLIS-CHALMERS MFG. Co. . . . E. A. Brugger has been named vice-president in charge of production for the KOEHRING Co., Milwaukee, Wis., heavy duty construction equipment; E. O. Martinson is chief engineer; E. W. Maas is vice-president and general manager of the KWIK-MIX Co.; Vice-President R. A. Beckwith will give full time to engineering development work at Koehring and its three subsidiaary companies; Vice-President F. H. Heine is director of foreign operations, and utility officer . . . L. F. Lawrence has been promoted to branch manager of the Charlotte, N. C., office of the MINNEAPOLIS-HONEYWELL REGULATOR Co. . . . Richard E. Hitchcock is field engineer and sales representative for HANNIFIN CORP. in the New York area.

END ANNOYING AND EXPENSIVE SPRING BREAK-UPS THE SOIL-CEMENT WAY

SPRING break-ups make many low-type roads and streets almost impassable with mud, ruts and potholes. Such conditions vex motorists, overburden maintenance crews and require costly repairs that gall taxpayers—who foot the bills.

Troublesome spring break-ups need not be a problem. You can end them by paving with soil-cement, the easy, economical way to obtain dependable, all-weather pavement for light-traffic roads and streets.

Notice the difference soil-cement makes on the New Jersey street in the photo. The portion of the street in the foreground is suffering from spring break-up. The rest of the street, paved with soil-cement, is unaffected.

Since it was introduced in 1935, soil-cement pavement has demonstrated its dependability in the thousands of miles of local roads and streets that have served for years under climatic conditions in all parts of the country. Service records showing years of use with little or no maintenance expense are another reason for the growing use of soil-cement pavement.

Best of all, soil-cement pavement is inexpensive to build. Soil already on the roadway supplies about 90 per cent of the required material.

Paving operations are swift, too, frequently up to one-half mile or more a day. The necessary construction equipment can be obtained easily and local crews quickly learn the simple paving procedure.

Write for free, illustrated literature on building, maintaining and reconstructing pavements with soil-cement. Distributed only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION

DEPT. A3a-17 • 33 WEST GRAND AVENUE • CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

"D" ROADSTER produces more than *on both* LONG HAULS.

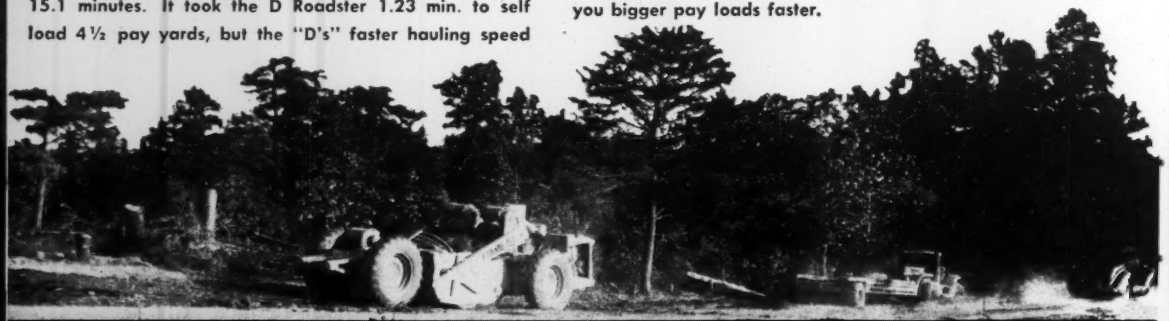
ROADSTER	CRAWLER
36 YARDS	18 YARDS
PAY YARDS PER HOUR	

... Doubled yardage output OF 100 H.P. CRAWLER AND 8-YARD SCRAPER ON 2350' 1-WAY HAUL

ON cut and fill work for secondary road near Tuscumbia, Alabama, a rubber-tired, 25 m.p.h. D Roadster recently proved itself *more* than a high-speed maintenance tool. The 100 h.p., 7-yard rig produced *twice* the yardage of a 100 h.p. crawler and 8-yard scraper, working on the same 2350' one-way haul. Check the record for yourself:

The crawler outfit loaded an average 5½ pay yards of common earth in 39 seconds . . . made a round trip every 15.1 minutes. It took the D Roadster 1.23 min. to self load 4½ pay yards, but the "D's" faster hauling speed cut overall cycle time to 6.3 min. . . . enabled it to chalk up 8 trips per hour to the crawler's 3.3. That's 18.15 pay yards hourly output with the crawler-scraper . . . ***36 pay yards for the higher-speed "D".***

That's why this one-man Roadster gets so much work done on maintenance-type dirtmoving . . . and is a yardage booster on production jobs. Remember, too, it's extremely profitable in fleet operation, where use of a pusher gives you bigger pay loads faster.



LET

See your Le Tourneau Distributor NOW for complete information

crawler-scraper combinations
.... *and* SHORT HAULS

ROADSTER	CRAWLER
80 YARDS	74 YARDS

PAY YARDS PER HOUR

... *Moved 9 per cent more* THAN 93 H.P. CRAWLER AND 10-YARD SCRAPER ON 425' 1-WAY HAUL

ON another Alabama county road job, near Heflin, the high-speed D Roadster outperformed a 93 h.p. crawler and 10-yd. scraper . . . this time, on a short haul of 425' one way . . . and in tough, rocky clay. Material had 25% voids and was ripped before loading. The bigger-capacity crawler combination loaded 6½ pay yards . . . averaged 11.4 loads . . . 74.1 pay yards per hour. The smaller, but faster, rubber-tired "D" self-loaded 4 pay yards . . . made 20 trips to the crawler's 11.4 . . . averaged 80 pay yards an hour, an increase of 9%!

Yes, even on short hauls like this, as well as on the longer hauls, today's rubber-tired, 25 m.p.h. "D" is proving Tournapull's reputation for more yards per hour at lowest net cost per yard.

You also get all the added advantages of modern, finger-tip electric controls . . . positive power steer . . . power-proportioning differential, which help keep hourly yardage high . . . ***plus*** 25 m.p.h. roadability for fast, self-powered moves from job to job.

Get all the facts on what this 7-yard D Roadster can do for *you*. Mail coupon ***TODAY!*** Talk with any owner . . . or ask your LeTourneau Distributor to give you the full story on D Roadster performance, price and delivery.

To: R. G. LeTOURNEAU, Inc., Peoria, Illinois

Please send D Roadster facts: ☐ Specs ☐ Price ☐ Delivery
☐ Would like analysis on my present job.

NAME ..... TITLE .....

COMPANY .....

TYPE OF BUSINESS .....

STREET .....

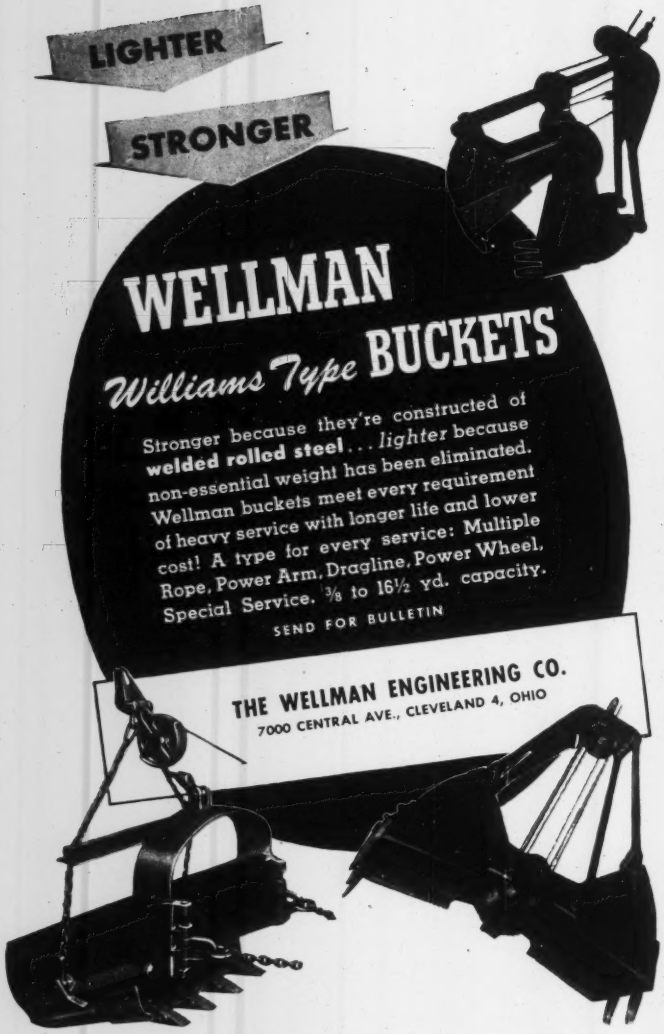
CITY ..... STATE .....

Tournapull—Trademark Reg. U.S. Pat. Off. R144

LETOURNEAU PEORIA, ILLINOIS HIGH-SPEED RUBBER-TIRED TOURNAPULLS

MORE WORK PER HOUR WITH RUBBER-TIRED POWER

LIGHTER
STRONGER
WELLMAN
Williams Type BUCKETS
Stronger because they're constructed of **welded rolled steel**... *lighter* because non-essential weight has been eliminated. Wellman buckets meet every requirement of heavy service with longer life and lower cost! A type for every service: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service. ⅜ to 16½ yd. capacity.
SEND FOR BULLETIN
THE WELLMAN ENGINEERING CO.
7000 CENTRAL AVE., CLEVELAND 4, OHIO



WELDING CONNECTORS
Saxe System Welded Connection Units for welded assembly
Saxe Units place in position and securely hold together structural parts to be welded.
As used in many welded structures they *eliminate all hole punching*, producing an economical, rigid, safe and quickly erected structural frame.
Write for 58 pg. Manual containing full engineering design information for welded structures.
J. H. WILLIAMS & COMPANY
Buffalo-7, New York
Canadian Representatives
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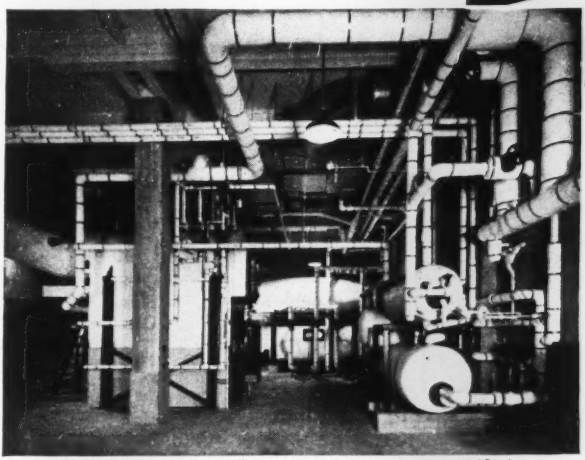
Diamond Core
Drilling
CORE BORINGS for Foundations, Dams, Bridges and all Heavy Structures
GROUT HOLES
Tinney Drilling Co.
Grafton, W. Va.

Deceased—Wm. E. Jenkins, 64, president and general manager of COLUMBIA BITULITHIC, LTD., Vancouver, B. C., died recently . . . A. M. Anderson, 62, retired chairman of the board and president of THE SISALKRAFT CO., Chicago, died Jan. 6 . . . Frank C. Jones, 61, president and general manager of THE OKONITE CO., Passaic, N. J., died Jan. 20.

Miscellany—UNIVERSAL ATLAS CEMENT CO. is buying land in Botetourt County, near Roanoke, Va., to get limestone and other materials for cement manufacture . . . At Richmond, Va., U. S. PLYWOOD CORP. has opened its 22d warehouse. Its other distributing units are at Baltimore, Boston, Brooklyn, Chicago, Cleveland, Cincinnati, Detroit, Fresno, Calif., High Point, N. C., Los Angeles, Milwaukee, Newark, New York, Oakland, Calif., Philadelphia, Pittsburgh, Portland, Ore., Rochester, N. Y., San Francisco, Seattle, and Toronto . . . FOXBORO CO., Foxboro, Mass., industrial instruments, is adding to its building at 5,151 Baum Blvd., Pittsburgh, and has opened a branch office at 123 W. College Ave., Appleton, Wis., M. A. Schreiner, manager . . . Business of STRAND BUILDING PRODUCTS CO., previously a subsidiary corporation of Detroit Steel Products Co., in future will be carried on by STRAND GARAGE DOOR DIVISION of DETROIT STEEL PRODUCTS CO. at 2,250 E. Grand Blvd., Detroit 11, Mich. . . . KEYSTONE DRILLER CO., have formed a new department to be known as the Equipment division, whose offices are located at 419 Wood Street, Pittsburgh, Pa. . . . New offices of the PITTSBURGH CORNING CORP., are at 307 Fourth Ave., Pittsburgh, Pa. . . . YALE & TOWNE opened a materials handling plant at Philadelphia, Pa., on Jan. 10. It was designed by BALLINGER CO. and built by TURNER CONST. CO. . . . JOHNS-MANVILLE SALES CORP., has opened a construction department in Richmond, Va., in the State Planters Bank Building. C. F. Tomlinson, formerly junior sales engineer in the Charlotte, N. C., area, is in charge . . . ALAN A. WOOD, INC., has been formed with offices at 1649 N. Broad St., Philadelphia 22, Pa., for sales and service of boilers and similar equipment . . . ZONOLITE CO., 135 So. LaSalle St., Chicago, has formed three new regional divisions for the sale of vermiculate building materials—Dearborn, Mich., Albany, N. Y., and Travelers Rest, S. C. . . . DURISOL, INC., 420 Lexington Ave., New York City, has opened a new roofing department with M. C. Fidao as manager.

Two tough steam jobs
INDOORS
OUTDOORS
Efficiently handled with
K&M "FEATHERWEIGHT"
85% Magnesia Insulation

Outdoor installation of large Eastern brewing company. Steam lines covered with double standard thickness "Featherweight" 85% Magnesia Pipe Insulation and weatherproof jacket.



Indoor installation in boiler room of office building. Steam lines insulated with "Featherweight" 85% Magnesia Pipe Insulation and boilers insulated with K&M Insulating Cement.

This outdoor installation required especially dependable steam pressure control . . . since the equipment was part of a large brewing operation. K&M "Featherweight" 85% Magnesia Insulation was specified and excellent results obtained. The indoor heating system required efficient temperature control . . . "Featherweight" solved the problem here. Indoors or out . . . when it's an insulation job . . . that's the place for K&M "Featherweight" 85% Magnesia Insulation.

"Featherweight" 85% Magnesia Insulation combines the high insulating properties of basic Carbonate of Magnesia with asbestos fibers as a binding agent . . . forming a lightweight, fireproof, efficient insulating material.

K&M Distributors, located strategically throughout the country, are experts on the application of K&M insulating materials . . . and can point the way to savings for you. Write us for further information.

K&M best in asbestos

Nature made Asbestos
Keasbey & Mattison Company has made it serve mankind since 1873.

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

YEAR ROUND MAINTENANCE

Easily Achieved with this $1500.00

STANDARD STEEL "S-J"

CONSERVES TIME "STARTING and GOING"
DUAL LEVER CONTROLS ALL OPERATIONS

BEFORE WINTER HITS, you can easily weatherproof roads, patch, seal and give necessary wear-resisting protection to all asphalt surfaces with the Standard Steel "S-J".

ON MILD WINTER DAYS, you can patch dangerous chuck holes with speed. The "S-J" is like a "highway patrol car," always ready for emergency.

SPRING and SUMMER, you'll use The "S-J" on all types of jobs, patching, sealing, building shoulders, reshaping curves; for construction of drives, walks, playgrounds, airports and all other secondary construction.

Want the facts on this all-year-'round, fast worker? You'll find the Standard Steel "S-J" meets your requirements in every way.

WRITE FOR CATALOG "S-J"

OTHER PRODUCTS
Asphalt Pressure Distributors, Tar Kettles, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms.

Built to the Highest **Standard** S-J-2

Standard Steel Works NORTH KANSAS CITY, MO., U.S.A.

DRILLING CONTRACTORS

DIAMOND AND SHOT CORE BORINGS — DRY SAMPLE BORINGS

Foundation Testing for Bridges, Dams and all Heavy Structures

Also

Manufacturers of Diamond and Shot Core Drills, Accessories and Equipment

SPRAGUE & HENWOOD, Inc.
Scranton, Pa. Dept. E, U. S. A.

"GUNITE" CONCRETE (Since 1915)

FOR • STEEL PLATE LINING • STEEL ENCASEMENT • BUILDING NEW WALLS • LINING WATER RESERVOIRS, TUNNELS AND SEWERS • PLATE LINING OF STEEL STACKS, BUNKERS, DUCTS • REPAIR OF DISINTEGRATED CONCRETE AND MASONRY • CANAL, DITCH AND DRAIN LINING.

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Branch Offices: Denver, Dallas, New Orleans
See our catalog in Sweet's

Elections and Activities

Geo. K. Leonard, TVA Upper Holston project manager, and E. M. Titus, head of TVA's structural steel section, have been nominated for president of the Tennessee Valley Section of the ASCE.

Lloyd Heller, chief engineer of the Fort Dodge, Iowa, sewage treatment plant, has been elected president of the Iowa Sewage Works Association. Other officers are Forrest E. Grover, city engineer of Council Bluffs, vice-president; and Leo Holtkamp, superintendent of the sewage works at Webster City, secretary-treasurer.

The Western Chapters Conference of the Associated General Contractors of America held in Salt Lake City recently was attended by some 50 industry representatives. The convention went on record as favoring the basing point price system, and adopted a resolution recommending salary increases for highway department personnel in states where engineering staffs are currently underpaid. Improvements in specifications, especially on highway jobs and Bureau of Reclamation projects, were likewise sought in resolutions passed. Discussing the national picture, James D. Marshall, assistant national managing director of AGC, pointed to the long record of amicable relations between western contractors and labor, but "found it difficult to predict" the election's effect on wages. Newly elected as chairman of the Western States AGC was H. L. Royden, Phoenix, Ariz. Others elected were Bruce Hazard, San Diego, first vice-chairman, and A. S. Horner, Denver, treasurer. Past President William C. Tait was chosen second vice-chairman. Conference speakers predicted a continued steel shortage aggravated by exports, with western construction particularly sensitive by the basing point freight rate changes. While cement is still reported short in some areas, conference officials indicated belief the downward trend in lumber prices would continue, and that softness in such prices might offset possible wage boosts.

Walter C. Russell of Detroit, Mich., president of the Peerless Cement Corp., has been elected chairman of the board of directors of the Portland Cement Association succeeding Joseph S. Young of Allentown,

When Old Style Magnetos Give Up...

BENDIX-SCINTILLA

H TYPE MAGNETOS...

Base Mounted H-Type Magneto

Flange Mounted H-Type Magneto

*TRADEMARK

Just Keep Sparking Along!

Dependability isn't something seasonal—it's a year around proposition and there are no short cuts in building it into engines. Specifying component parts you know will stand up under all operating conditions is the *only* answer! Ignitionwise, no magneto of its type will out-perform or out-last the Bendix-Scintilla* H Magneto. Our long experience in building ignition equipment for the vast majority of aircraft engines is reflected in this magneto for one-cylinder engines. Include the Bendix-Scintilla H-Type Magneto in your specifications. For further details, see your distributor or write the factory direct.

OUTSTANDING FEATURES YOU'VE ASKED FOR

- Waterproof coil
- Waterproof, high-tension outlet
- Higher voltage at starting speeds
- Constant spark over entire speed range
- Equipped with impulse coupling
- Compact and sturdy construction

SCINTILLA MAGNETO DIVISION of

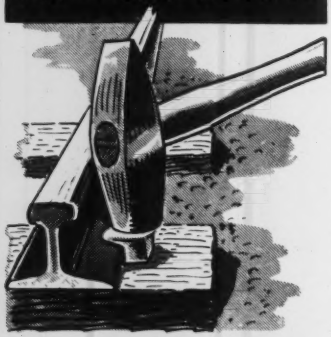
Bendix AVIATION CORPORATION

BENDIX SCINTILLA

SIDNEY, NEW YORK

Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N. Y.

A SLEDGE IS RIGHT FOR RAILROAD SPIKES



For PILE DRIVING

IT TAKES

WARRINGTON-VULCAN

Single-Acting STEAM PILE HAMMERS

Warrington-Vulcan packs all the power you'll ever need on any pile driving job. That's a job-tested fact.

Contractors who know will tell you again and again that it's a great hammer, always dependable and economical on job after job, year after year. It's rugged, durable, simple in design and operation . . . built to meet requirements established by experienced contractors.

The Warrington-Vulcan operates at medium steam pressure, delivering a moderate frequency of low velocity blows from a relatively heavy ram to drive piles of any description.

Write today for complete details and the name of your nearest distributor.

VULCAN IRON WORKS Since 1852

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Chicago 12 ---Illinois

Pa., president of the Lehigh Portland Cement Co. Mr. Russell has taken a prominent part in planning for the association's new research laboratory under construction near Chicago and has long been active in the Portland Cement Association. The activities of this national organization are limited to scientific research, development of new or improved products and methods, technical service, promotion and educational efforts, including safety work, and are primarily designed to improve and extend the uses of portland cement and concrete.

Mr. Russell, a graduate of the University of Michigan, during World War I was an engineer with the Emergency Fleet Corporation. From 1919 to 1922 he was assistant city engineer of Flint, Mich. For 11 years prior to 1933, he was a contractor and engineer in Detroit. He became vice-president of the Peerless Cement Corporation in 1933, and was elected president in 1942. During World War II he was a member of the Cement Industry Advisory Committee of the War Production Board.

Mayor Raymond E. Snyder of Waterbury, Conn., has been elected chairman of the Municipal Officials Committee, organized to seek state aid to finance sewerage projects. Forty municipalities are represented by the committee and projects for which funds are sought in part total $30,000,000. Richard Martin, director of the State Water Commission, will serve as secretary. A proposal that the committee seek to have state highway town aid funds diverted to aid construction of sewage plants wae rejected.

MAJOR MEETINGS

American Concrete Pipe Association, 41st annual convention, John Marshall Hotel, Richmond, Va., March 11-12.

Construction Industries Association, Hotel Statler, Washington, D. C., March 8.

Mississippi Conference of State Highway Departments, Edgewater Beach Hotel, Chicago, Ill., Mar. 10-12.

American Institute of Architects, annual meeting, Rice Hotel, Houston, Tex., March 15-18.

American Railway Engineering Assn., Palmer House, Chicago, Ill., March 15-17.

American Society of Civil Engineers, Skirvin Tower Hotel, Oklahoma City, Okla., April 20-23.

American Wood Preservers' Association, Jefferson Hotel, St. Louis, Mo., April 26-28.

First International Civil Engineering Congress, Mexico City, Mexico, April 30-May 7.

Men and Jobs

Frank S. Altman, district engineer for the Portland Cement Association, Minneapolis, Minn., office has retired. He will be succeeded by **F. R. McComb** of the Indianapolis, Ind., office.

W. C. Dutton, Jr., of Atlanta, Ga., former lieutenant in the Army Engineering Corps, and until recently with the Tennessee State Planning Commission at Knoxville, Tenn., has been named assistant director of the department of city planning at Greensboro, N. C. He succeeds **Kevin Lynch,** who has resigned to become an instructor at Massachusetts Institute of Technology.

Ira F. Willard is city manager of Hopewell, Va. **James D. River,** city engineer of that city, has resigned to become town engineer and assistant to the town manager of Front Royal, Va.

The appointment of managers at the Logan International Airport in East Boston and at Bedford, Mass., were recently announced. **Col. Albert L. Edson,** formerly manager at Bedford, becomes head of the East Boston field, and **Robert M. Ross,** airport maintenance engineer at Logan, will take over the management at Bedford. Colonel Edson is a graduate of Massachusetts Institute of Technology, Ross of Boston College.

James Glynn, formerly chief of the Transportation and Communications Branch in the Commerce Department's Office of International Trade, has gone to Greece to be director of transport for the ECA Mission to Greece. He will be in charge of reconstruction for railroads, highways, coastal shipping and civil aviation under the ECA aid program (ENR, July 1, p. 4). Before joining the Commerce Department, Mr. Glynn in 1945-46 was chief of the Transportation Mission of the Institute of Inter-American Affairs in Colombia, South America. He served in Europe during the war as a major in the Transportation Corps.

E. T. Gove of North Bay, Ont., is district engineer at London, Ont., for the Canadian National Railways.

Francis D. Kuckuck is city manager for Celina, Ohio. He is a graduate of the school of engineering, Ohio Northern University. He was chief assistant engineer for Fostoria, Ohio, from 1928 to 1903, and Mercer County engineer in 1936.

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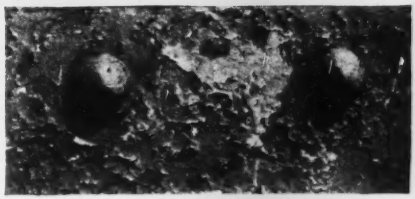
For further details write for folder ADG-1066B — "Flame Cleaning and Dehydrating Old Steel Structures", and folder ADG-1067A—"Flame Cleaning and Dehydrating New Steel Structures". Address: Dept. EN-7320, Air Reduction, General Offices: 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. Represented Internationally by Airco Export Corporation.



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BOSTON • CINCINNATI • NEW ORLEANS

W. S. Teagarden, engineer, formerly with the U. S. Engineers at West Memphis, Ark., has been appointed city engineer for West Memphis, succeeding **W. H. Cushman**, resigned.

Harry C. Smith, Sr., civil engineer of the New York State Department of Public Works, was honored recently by the Syracuse Chapter, New York State Civil Service Association. He is believed to hold the longest service record of any state employee in Syracuse—45 years.

Fred A. Boddy, **Max W. Benjamin**, and **Frederick H. Patz** have organized Boddy-Benjamin Associates, Inc., for engineering and architectural service in the Detroit Building, 2210 Park Ave., Detroit, Mich. All three principals of the firm are University of Michigan men.

Joachim E. Liebmann has been appointed engineer for the San Diego, Calif., harbor department. He formerly was with the Standard Oil Co. refinery at Richmond, Calif. He holds a bachelor's and master's degree in civil engineering from the University of Wisconsin.

S. L. Taylor, division engineer of the Public Roads Administration in charge of Division 5-north, at St. Paul, Minn., is being transfered to Washington to take charge of Division 2. **Walter V. Buck**, in charge of design in Division 2, will fill the St. Paul vacancy. Announced is the transfer of **Division Engineer C. E. Swain** from Division 2 headquarters at Washington to Division 1 headquarters at Albany, N. Y., succeeding **Division Engineer A. G. Bruce**, retired.

Robert O. Swain has been promoted to general manager and secretary of the International Road Federation.

Harold M. Olson, was appointed consulting maintenance engineer for the Morton Salt Co., Chicago, on Jan. 1. For the last 39 years Mr. Olson has specialized in industrial water treatment problems and equipment problems.

Charles T. Holmes, Texas State Highway Department senior resident engineer at Kerrville, has been made assistant district engineer of District 15 at San Antonio, succeeding **R. A. Bossy**.

Bryan Walls, of Wilmington, Del., associated with the building construction in Delaware for more than 30 years, has been named New Castle County building inspector.

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- ★ New heavy duty 5-speed transmissions for operating flexibility.
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- ★ Ford Super Quadrax 2-speed axle with vacuum shift for performance flexibility in Model F-8 (single speed axle also available); single-speed Quadrax Hypoid Axle in Model F-7.
- ★ Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.
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- ★ Nationwide service from over 6,400 Ford Dealers.
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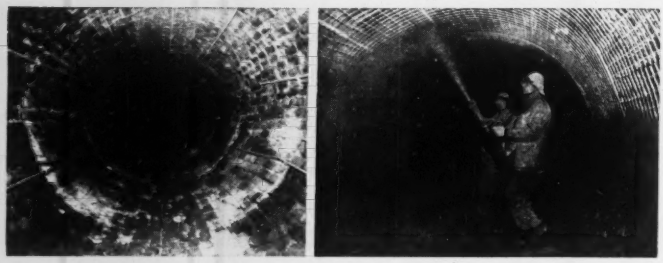

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OBITUARY

James Robertson, contract engineer for the Dominion Bridge Co.'s Pacific division, died in Vancouver, B. C., recently. He was one of the outstanding structural and bridge engineers in Canada. After serving an apprenticeship at Kilmarnock, Scotland, he went to Canada in 1907, joining the engineering department of Dominion Bridge. He was graduated from McGill University in 1914 and returned to the company, going to Vancouver in 1928.

William W. Kessler, 60, a civil engineer for the Southwestern Bell Telephone Co., at St. Louis, Mo., died Jan. 30.

John Malloy, county engineer for Scott County, Davenport, Iowa, for 35 years died recently.

Chas. W. Hardt, 74, Harrisburg, Pa., a resident engineer for the state highway department, died Feb. 4 in an automobile accident.

Earle B. Eldedge, 57, formerly a civil engineer in Boston, Mass., died Jan. 26 in Hyannis, Mass. He was a graduate of Tufts College Engineering School and served as a civil engineer with the Aberthaw Construction Co. of Boston for 16 years.

Lee Lashley, 66, of Durham, N. C., former highway maintenance supervisor with the North Carolina State Highway and Public Works Commission, died Jan. 25.

James S. Hallum, 39, structural designer for the South Dakota state highway commission, died recently at Brady, Tex. He was a graduate of Rice Institute and before moving to Pierre, S. D., he had worked in the bridge division of the Texas and Tennessee highway departments.

Thom W. Hall, 45, Maryland State Roads Commission engineer, died at Cheverly, Md., on Feb. 2. He was an assistant to Joseph Chaney, Southern Maryland district engineer of the Maryland State Roads Commission.

Frank C. Christie, 53, chief building inspector, Regina, Sask., died Feb. 1.

Charles J. Franklin, 48, formerly a state highway engineer in Nebraska, died at Mill Valley, Calif., Jan. 28.

Richard Williams, 63, Akron, Ohio, former Summit County civil engineer for 15 years, died Feb. 5. He had been associated with the McNeil Machine & Engineering Co.

George W. Koonce, 90, former chief legal counsel to the Corps of Engineers, who had served under 19 different Chiefs of Engineers, died Feb. 1 in Washington, D. C. He had spent 60 years of service in the Corps of Engineers until his retirement two years ago.

Harry B. Foote, 63, retired contractor, died Jan. 29 at Ballston Spa, N. Y. For a number of years he was associated in New York City with the P. T. Cox Contracting Co., and the Fred T. Ley Co., as superintendent on bridge construction. He later formed his own corporation, doing construction work in the metropolitan area.

Tracy R. Cobb, 54, engineer in charge of permits and engineer reports at the Wilmington, N. C., district office of Army Engineers, died Feb. 13. He was a lifelong employee of the Wilmington office, which he joined in 1913, and for many years he was in the sub office at New Bern, N. C.

Ernest E. Easley, 55, a civil engineer with the Fieldcrest Mills at Leaksville, N. C., for the last 30 years, died Feb. 15.

James C. Lattimore, 37, Charlotte, N. C., engineer employed by B. O. Vannort, Charlotte, was electrocuted Feb. 15, when checking on a rural electrification project at Shallotte, N. C. He served three years with the Seabees.

Philadelphia Turns On City-Owned Street Lights

Philadelphia, Pa., took its first step into city-owned street lighting when Mayor Bernard Samuel recently turned on the first section of new type mercury vapor lights on the Vine Street approaches to the Philadelphia-Camden bridge. The 56 lights, stretching over the first half mile of a proposed several miles of widening of the street, is the start of a general plan under which numerous state highways and main boulevards in the city will have their lighting standards revamped to use the new lights developed by the Westinghouse Electric Corp., which are described as short-arc mercury-vapor lights, yield 21,000 lumens compared with 10,000 lumens per unit for the city's largest incandescent lamps.

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ELSIE EAVES, Manager J. A. MAHONEY, Reports E. R. BIGGERSTAFF, M. R. ROESSLER, Statistics

WATER SUPPLY

●**Fla., Miami**—City Water Bd., water treatment plant on Gallaway Rd. Over **$1,000,000.** CD 11/8/44—ENR 1/30/44.

Ill., Carthage—City, City Hall, WW sys. and sewer extens. **$100,000.** Crawford, Murphy & Tilly, 400½ E. Adams St., Springfield, consult. engrs.

Mass., Charlestown — Commonwealth of Mass., M. D. C., 20 Somerset St., Boston, replacing pump. units, pump. station, **$170,000.**

N. J., Trenton—City, City Hall, water sys. addns. Over **$250,000.** Havens & Emerson, 233 Broadway, New York, N. Y., consult. engrs. CD 7/26—ENR 8/5.

N. C., Morganton—City, Claude Helms, mgr., City Hall, voted bonds, filter plant, Catawba River, **$100,000.** J. N. Pease & Co., 119½ E. 5 St., Charlotte, consult. engrs. CD 1/17—ENR 2/3.

Okla., Del City—City, voted bonds, WW sys. **$120,000.** Harry Becker, Court House, Oklahoma City, consult. engr.

Tex., Electra—City, voted bonds, domestic water supply dam, on Camp Creek on W. T. Waggoner Ranch, 6 mi. southwest of here, **$350,000;** 6 mi. watermain between dam and city limits and pump. station, **$200,000.** Freese Nichols, 40 Danciger Bldg., Fort Worth, consult. engrs. CD 1/28.

Tex., Houston—Harris County Water Control & Improv. Dist. 11, Greens Bayou Area, c/o N. W. Black, Courthouse, voted bonds, WW imprvs., extens., incl. larger c. i. mains, fire plugs, water supply well, etc. **$125,000.**

Tex., Kilgore—City, City Hall, watermain extens. **$200,000.** A. P. Noyes, Kilgore, consult. engr.

●**Wash., Yakima**—City, City Hall, pipeline: **$1,000,000.** A. B. Collins, city engr.

SEWERS, WASTE DISPOSAL

Calif., Concord — City, City Hall, voted **$525,000** bonds, sewage disposal plant. John S. Bates, 3134 Eton Ave., Berkeley, engr. CD 1/19—ENR 2/3.

Colo., Evergreen—Town, plans by Ripple & Howe, 424 Cooper Bldg., Denver, installing approx. 20,000 ft. sewer lines constr.; sewage plant for complete treatment; **$150,000.**

Colo., Wheat Ridge—Town, Municipal Bldg., voted **$900,000** bonds sanitary sewerage sys. in area bounded by W. 26 Ave. and Clear Creek and Sheridan Blvd. to Estes St. and incl. approx. 32.5 mi. sewer line. Carroll H. Coberly, 1441 Welton St., Denver, consult.

Ill., Alorton—Village, Fire Dpt., sanitary sewers and lift station, discharging into East St. Louis Outlet. **$438,415.** J. G. Cooney, 19 N. Illinois St., Belleville, engr. CD 7/31/46—ENR 8/22/46.

Ill., Peoria—City, City Hall, storm water sewers, Sewer Dist. 1, west boundary, Knoxville Ave., north boundary, Reservoir Blvd., west boundary, Prospect Rd., south boundary, McClure Ave., **$883,550;** Sewer Dist. 2, west boundary, Parkside Dr., north boundary, W. Armstrong Ave., east boundary, Sheridan Rd., south boundary St. James St. and Laura Ave., **$470,245;** Sewer Dist. 3, west boundary, Dry Run Creek, north boundary, Republic St., east boundary, Knoxville Ave., south boundary, Richmond Ave., **$124,622;** Sewer Dist. 4, west boundary, Sheridan Rd., north boundary, Lake Ave., east boundary, Bigelow St., south boundary, Corrington Ave., **$121,044.** CD 11/13/46—ENR 11/28/46.

●**Ill., Springfield**—City, City Hall, rehabilitation sewerage sys., **$1,000,000.** Crawford, Murphy & Till, 400½ E. Adams St., and Jenkins, Merchant & Nankivil, 1428 E. Washington St., Springfield, consult. engrs. CD 1/16/46—ENR 1/24/46.

La., Donaldsville—Ascension Parish Police Jury, A. C. Simoneaux, pres., Donaldsonville, bond election May 25, drainage proj. **$265,000.** CD 1/16/44—ENR 1/27/44.

Mass., Wellesley — Town, Bd. Selectmen, Wellesley, sewers, **$100,000.** CD 3/23/45—ENR 3/29/45.

Okla., Anadarko—City, City Hall, bond election Mar. 15, sanitary sewer extens., sewage disposal plant, **$368,000.** C. H. Guernsey & Co., 1414 N. Robinson St., Oklahoma City, consult. engrs. CD 12/18—ENR 12/9.

Okla., Tulsa—City, City Hall, sanitary sewers for 10 sq. mi. suburban area east of here, **$125,000.** W. F. Shaw, 111 S. Elwood St., consult. engr. CD 2/7/48—ENR 2/19/48.

Pa., Whitehall Boro (br., Pittsburgh) — Whitehall Boro, Boro Hall, Baptist Rd., Whitehall, Pittsburgh, sewage treatment plant, **$200,000.** Blum, Weldin & Brown, Bakewell Bldg., Pittsburgh, boro engrs.

Pa., Willow Grove—Upper Moreland Twp. Comn., Willow Grove, sanitary sewers, Evans Ave., etc. **$100,000.** George R. Mebus, 112 Easton Rd., Glenside, consult. engrs.

Tex., Pampa—City, C. A. Huff, mayor, remodeling, enlarging sewerage plant, **$107,000.** Roberts & Merriman, Pampa, consult. engrs. Dick G. Pepin, city engr. CD 10/13—ENR 10/28.

Tex., Kilgore — City, c/o Roy H. Land, mayor, sewer main extens. and construct 2 m. g. sewage disposal plant, **$500,000.** A. P. Noyes, Kilgore, consult. engr.

BRIDGES

●**California**—U. S. Eng., 74 New Montgomery St., San Francisco, railroad bridge to replace present Fruitvale Ave. bridge, Oakland and Alameda, Alameda Co. **$1,000,000.**

Colorado—State Hy. Dpt., Denver.

Douglas Co.—overpass north of Larkspur on State Hy. 1, Colo. Proj. FI 002-2 (3), **$130,000.**

Jefferson Co.—underpass on State Hy. 72, Arvada northwest, Colo. Proj. SG 0086 (1), **$100,000.**

Larimer Co.—widening bridges on State Hy. 1, north and south of Loveland, Colo. Proj. F 004-01 (8), **$345,000.** Mark U. Watrous, state hy. engr.

Ind., Gosport—Bd. Comrs. Monroe Co., T. N. Welsh, aud., Court House, Bloomington, and Owen Co., H. W. Foley, aud., Court House, Spencer, rein.-con. or structural steel bridge across west fork White River, **$500,000.** W. S. Harding, Bloomington, Monroe Co., engrs., O. S. Johnson, Spencer, Owen Co. engr.

Tennessee—State Hy. Comn., Nashville.

Tipton Co.—bridge over Hatchie river between Covington and Brownsville, **$500,000.**

Wash., Yakima—Yakima Co., Courthouse, bridge over Yakima River between Mabton and Granger, **$250,000.** O. E. Brashears, co. engr.

STREETS AND ROADS

Calif., Brea-La Habra — Bd. Supervs., Orange Co., Courthouse, Santa Ana, imprv., Central Ave. **$112,000.** H. Springer, Courthouse, hy. engr.

●**Colorado**—State Hy. Dpt., Denver, projects withdrawn.

Adams Co.—grav. FI 2-1 (4), north of Denver State Hy. 265, **$300,000.**

Douglas Co.—grav. FI-46 (6), Frankstown and Colorado Springs, State Hy. 83, **$1,000,000.** FI-46 (5), Frankstown south, State Hy. 83, **$265,000.**

El Paso and Teller Counties—minor imprvs. Pike Peak Hy., west of Colorado Springs, State Hy. 250, S-0092 (1), **$65,000.**

Las Animas Co.—oiling, etc., Trinidad-West State Hy. 12 S-0036 (1), **$170,000.** CD 1/28/48—ENR 2/19/48.

●**Colorado**—State Hy. Dpt., Denver.

Arapahoe Co.—grading, surf. State Hy. I, Colo. Proj. FI 002-2 (7)2 Denver and Castle Rock, **$500,000.**

Baca Co.—grading, surf. State Hy. 59, between Lamar and Springfield, Colo. Proj. F 028-2 (4), **$70,000.**

Oiling on State Hy. 59, Lamar and Springfield, Colo. Proj. S 028-2 (5), **$160,000.**

Cheyenne Co.—grading, surf. State Hy. 8, Arapahoe and Kansas Line, Colo. Proj., F 017-3 (1), **$270,000.**

Delta Co.—grading, surf. State Hy. 135, Paonia and Somerset, Colo. Proj. S 0119 (6), **$160,000.**

Oiling State Hy. 135, Hotchkiss and Paonia, Colo. Proj. S 0119 (5), **$80,000.**

Denver Co.—right-of-way, Valley Hy., State Hy. 185, Denver, Colo. Proj. UI 002-2 (8), **$258,820.**

Curb and gutter, West Colfax Ave. on State Hy. 2, Denver, Colo. Proj. SP 11-2-508, **$88,000.**

Douglas Co.—grading, surf. State Hy. 86, Castle Rock and Franktown, Colo. Proj. S 0040 (1), **$70,000.**

Grading, surf. State Hy. 83, Franktown, South Colo. Proj. S 0170 (1), **$100,000.**

Elbert Co.—grading, surf. State Hy. 86, Franktown-Koiwa, Colo. Proj. S 0028 (2), **$50,000.**

El Paso Co.—grading, surf. State Hy. 1, Colorado Springs, North Colo. Proj. F 116 (1), **$383,000.**

El Paso and Douglas Counties—oil surf. State Hy. I, between Monument and Lakspur, Colo. Proj. FI 002-2 (6), **$230,000.**

Fremont and Pueblo Counties—oil surf. State Hy. 8, between Canon City and Pueblo Colo. Proj. F 001-3 (7), **$210,000.**

Garfield Co.—grading, surf. State Hy. 13, Rifle, North Colo. Proj. F 018-1 (3), **$320,000.**

Gunnison Co.—stabilizing, oiling State Hy. 135, Gunnison, North Colo. Proj. S 0119 (4), **$150,000.**

Jackson Co.—grading, surf. State Hy. 14, Muddy Pass-Welden, Colo. Proj. S 0115 (2), **$550,000.**

Stabilizing, oiling State Hy. 127, Cowdrey-Wyoming line, Colo. Proj. S 0105 (1), **$165,000.**

Jefferson Co.—grading, surf., structure on State Hy. 20, Clear Creek-Canon, west of Golden, Colo. Proj. F 005-3 (6), **$800,000.**

Surfacing and oil on State Hy. 8, between Morrison and Conifer, Colo. Proj. F 016 (1), **$145,000.**

La Plata Co.—grading, surf. State Hy. 10, Durango-Hesperus, Colo. Proj. F 002-1 (3), **$280,000.**

Grading, surf. on State Hy. 72, Durango-Ignacio, Colo. Proj. S 0154 (1), **$120,000.**

Larimer Co.—grading, surf. State Hy. 14, Ft. Collins, East Colo. Proj. F 004-1 (6), **$675,000.**

Grading, surf. State Hy. 185, between Wellington and south of Wellington, Colo. Proj. FI 002-1 (5), **$924,586.**

Grading, surf. State Hy. 14, Oudre Canaon near Ft. Collins, Colo. Proj. S 0104 (2), **$200,000.**

Right-of-way on State Hy. 185, Wellington, North Colo. Proj. FI 002-1 (6), **$95,000.**

Mesa Co.—grading, surf. State Hy. 4, between Grand Junction and Palisade, Colo. Proj. F 001-1 (1), **$550,000.**

Montezuma Co.—grading, surf. State Hy. 145, Colo. Proj. S 0153 (3), Dolores-Cortez, **$87,694.**

Morgan Co.—grading, surf. State Hy. 52, south of Wiggins, Colo. Proj. S 0030 (1), **$200,000.**

Otero Co.—grading, surf. State Hy. 10, Hawley-East Colo. Proj. S 0012 (1), **$80,000.**

Pueblo Co.—grading, surf. State Hy. 1, Pueblo, Colo. Proj. UI 002-3 (2), **$62,000.**

Grading, surf. State Hy. 96, Pueblo, West Colo. Proj. S 0016 (2), **$300,000.**

Oil surf. State Hys. 1 and 85, Pueblo, North Colo. Proj. F 001-3 (8), **$60,000.**

Oiling State Hy. 1, Pueblo, Colo. Proj. UI 002-3 (4), **$81,000.**

Rio Blanco Co.—grading, surf. State Hy. 64, Rangley, Meeker, Colo. Proj. S 0144 (6), **$500,000.**

Rio Grande Co.—oiling State Hy. 15, Monte Vista, South, Colo. Proj. S 0113 (3), **$50,000.**

Routt Co.—grading, surf. State Hy. 7, west of Steamboat Springs, Colo. Proj. F 005-2 (3), **$150,000.**

Grading, surf. State Hy. 131, Hayhro-Oak Creek, Colo. Proj. S 0121 (6), **$250,000.**

Oil surf. State Hy. 2, west of Steamboat Springs, Colo. Proj. F 005-2 (4), **$100,000.**

San Miguel Co.—grading, surf. State Hy. 145, Colo. Proj. FLH 7 (1), and S 0150 (1), **$225,000.**

Sedgwick Co.—stabilizing, oiling State Hy. 51, Julesburg and Holyoke, Colo. Proj. S 0001 (3), **$329,000.**

Summit Co.—grading, surf. State Hy. 91, between Loveland Pass and Dillon, Colo. Proj. FI 012 (1), **$100,000.**

Summit and Clear Creek Counties—grading, surf. State Hy. 91, Loveland Pass, East and West, Colo. Proj. FI 012-1 (3), **$187,245.**

Oil surf. State Hy. 91, Loveland Pass, East and West, Colo. Proj. FI 012-1 (4), **$70,000.**

Weld Co.—grading, surf. State Hy. 392, Hazenville, West, Colo. Proj. S 0034 (1), **$200,000.**

Yuma Co.—oil surf. State Hy. 34, Wray, East, Colo. Proj. F 011-1 (3), **$90,000.** Mark U. Watrous, state hy. engr.

Conn., New Britain—City, P. Wks. Dpt., New Britain, repairing, paving various streets, **$150,000.**

Conn., Norwalk—City, Irving J. Freese, mayor, City Hall, paving several sections, **$750,000.** Paul T. James, City Hall, city engr. CD 1/21/46—ENR 2/21/46.

●**Ga., Savannah**—City, Oglethorpe Avenue Expressway, **$1,000,000.** D. D. Hankins, city engr.

Ill., Joliet—City, City Hall, asph. street resurf., **$150,000.** H. R. Goodspeed, city engr.

●**Ill., Peoria**—City, City Hall, imprv. W. Forrest Hill Ave., Sect. 59 C. S., from University St. to alley east of Avalon St., **$47,100;** widening Ave. from E. Gift to E. Forrest Hill Aves., Sect. 57 C. S., **$97,387,** sub-class I-H, Sheridan Rd. from Main St. to McClure Ave., Sect. 51-1 C. S., **$56,548;** North St. from Nebraska Ave. to Maple St., Sect. 42-C C. S., **$67,200;** Main St. from Western Ave. to Sheridan Rd., **$250,000;** Knoxville Ave. from Main St. to Hamilton Blvd. and from Pennsylvania Ave. to Carrington Ave., Sect. 43-1 C. S., **$300,000;** N. Adams St. from Pennsylvania Ave. to Abingston Sts., Sect. 58-1 C. S., **$135,000;** MacArthur Hy. from Moss Ave. to Bradley and Bourland Aves., Sect. 12A-6 C. S., **$10,000;** Monroe St. from Jackson to Abington Sts., **$50,000;** Adams St. from Franklin to Fulton Sts., **$40,000;** Moss Ave. from Western Ave. to Sheridan Rd., **$31,200;** Lincoln Ave. from S. Adams St. to Bush Ave., **$50,000;** Prospect Rd. from Wilcox to Loveland Aves., **$150,000;** Sheridan Rd., Sect. 51-2 C. S. from McClure Ave. to Hanssler Pl., Sect. 51-2 C. S., **$66,300;** North St. from Main St. to Nebraska Ave., Sect. 42-1 C. S., **$128,086;** Main St. from Sheridan Rd. to Glen Oak Ave., **$225,000;** Knoxville Ave. from Hamilton Blvd. to Pennsylvania Ave., Sect. 42-2 C. S., **$250,000;** N. Adams St. from Abington to Camblin Sts., Sect. 13-2 C. S., **$56,000;** Loucbe Ave. from Universal St. to McClure Ave., Sect. 59 C. S., **$185,000;** Westerr Ave from Washington to Smith Sts., Sect. 21 C. S. **$395,000;** Spring St. from N. Adams St. to Glen Oak Ave., Sect. 41 C. S., **$145,941;** Lincoln Ave. from Bush to Seventh Sts., **$110,000;** Maple St. from S. Washington to S. Adams Sts., **$10,000;** Glen Oak Ave. from Spring St. to Prospect Rd., **$100,000;** Prospect Rd. from Glen Oak to Wilcox Aves., **$300,000;** widening, sub-class I-H Jackson St. from Washington St. to Glendale Ave., **$100,000;** sub-class I-H on soil cmt., London Ave. from Prospect Rd. to Columbus Ave., **$5,569;** Michigan Ave. from Ellis to North Sts., **$12,059;** Albany St. from West City Limits to Sheridan Rd., **$13,856;** Grinnell St. from S. Adams to Griswold Sts. **$31,626;** Wilson Ave. from Pros-

(Continued on page 94)

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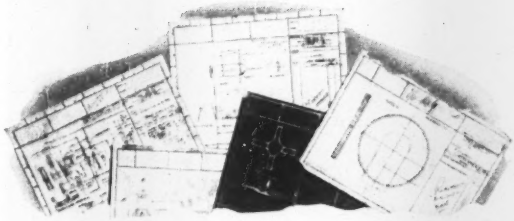

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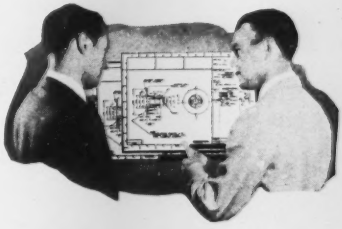

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(Continued from page 92)

pect Rd. to Columbus Ave., **$5,569**; Flora Ave. from Hampton Ct. to McClure Ave., **$20,002**; Alice Ave. from Loucks to W. Forrest Hill Aves., **$27,075**; Gift Ave. from Sheridan Rd. to Bootz Ave., **$12,350**; Machin Ave. from Woodruff Blvd. to Richmond Ave., **$6,004**; Carrie Ave. from Gale to McClure Aves., **$13,300**; Wilbert Ave. from Carrie Ave. to University St., **$4,750**; Marion Ave. from Pearl Ave. to University St., **$10,925**; Pearl Ave. from Gale to McClure Aves., **$6,650**; Woodruff Blvd. from University St. to Nebraska Ave., **$65,100**; bit. resurf. Center Bluff Street Imprv. Dist. 1, Linn St. from Columbia Terrace to Nebraska Ave., Bigelow St. from Columbia Terrace to Nebraska Ave., **$22,387**; East Bluff Street Imprvt. Dist. 1, Virginia Ave. from Peoria Ave. to Prospect Rd., Arcadia Ave. from Knoxville Ave. to Prospect Rd., **$39,937**; East Bluff Street Imprvt. Dist. 2, Pennsylvania Ave. from Knoxville to Peoria Aves., California Ave. from Pennsylvania to Frye Aves., Indiana Ave. from Glen Oak to Ravine Aves., Ravine Ave. from Indiana to Wisconsin Aves., LaSalle St. from Indiana to Wisconsin Aves., **$27,670**; West Bluff Street Imprvt. Dist. 3, Windom St. from University St. to Sheridan Rd., Garfield Ave. from Main St. to Columbia Terrace, Fredonia Ave. from Western Ave., to University St., Cooper St. from Sherman to Bradley Aves., **$37,687**; Fayette Street Imprvt. from Water St. to Knoxville Ave., **$159,296**; Downtown Street Imprvt. Dist. 1, Eaton St. from Water to North Adams Sts., Hamilton Blvd. from Water to Washington Sts., Main St. from Water to Adams Sts., Fulton St. from Water to Monroe Sts., Liberty St. from Water St. to Madison Ave., Harrison St. from Water St. to South Jefferson Ave., Walnut St. from Water St. to S. Jefferson Ave., East State St. from Water St. to Second Ave., **$122,450**.

● **New York**—Bureau Contracts & Accounts, Bertram D. Tallamy, Supt. P. Wks., Albany.

Erie Co.—Constructing 1.35 mi. McKinley Parkway on new location from Ridge Rd. to point south of the New York Central R.R. tracks, connecting with the Erie Thruway, incl. bridges over intersecting railroad tracks and high connection with Martin Rd.

Reconstructing 1.9 mi. Hamburg Turnpike from south city line to Buffalo city line with divided traffic arteries, and reconstructing both the South Buffalo R.R. overhead structures at Fourth St. and the highway bridge over Smokes Creek.

Reconstructing 0.7 mi. Hamburg Turnpike from point near Mile Strip Rd. northerly to the south city line.

Reconstructing, by the city 0.25 mi. McKinley Parkway from Ridge Rd. to McKinley Circle at north city line with two 24 ft. roadways.

Incorporation of Ridge Rd. from McKinley Parkway to Hamburg Turnpike into the State Arterial Sys. Est. **$2,790,000**.

● **Rhode Island**—State Southern Rhode Island Parkway Auth., Providence, toll parkway exten. from Connecticut State line at Westerley to Massachusetts State Line near Tiverton, touching western approach Jamestown Bridge and eastern approach Newport Bridge. Approx **$5,000,000**.

● **Tex., Beaumont**—City, City Hall, voted bonds, imprvs., repairs, surfacing 100 widely scattered streets. **$1,000,000**. R. C. Black, city engr. CD 8/27—ENR 8/16.

Washington—State Hy. Dpt., Olympia, snow sheds between North Bend and summit of Snoqualmie Pass on Primary State Hy. 2, King Co. **$750,000**.

Alaska, Juneau—City, City Hall, voted bonds, street imprvs. **$260,000**.

EARTHWORK, WATERWAYS

Ark., North Little Rock—City, drainage and flood control proj. **$800,000**.

● **Conn., Stonington**—State, Raymond A. Thatcher, comptroller, State Capitol, Hartford, developing Stonington Harbor, incl. docks and bldgs. **$1,000,000**.

● **Texas**—Texas & Louisiana Intracoastal Canal Assn., c/o John Fulbright, and Lower Trinity River Assn., c/o Dean Tevis, pres., Beaumont, constructing Dam B of McGee Bend Dam Proj. $6,000,000; drainage (via Anahuac), **$1,500,000**.

Tex., Conroe—Montgomery County Soil Conservation Dist., Courthouse, terracing, grading, draining, earthen water storage tanks. **$100,000**.

● † **Alaska**—Bureau Reclamation, Dpt. Interior, Interior Bldg., 19 and C Sts., N.W., Wash. 25, D. C., hydroelectric proj. at Eklutna lake near Anchorage. **$21,580,000**.

AIRPORTS AND AIRBASES

† **Ariz., Tucson**—SWIMMING POOL—U. S. Engr., 751 S. Figueroa St., Los Angeles, Calif., Davis-Monthan Air Force Base swimming pool. **$119,000**.

† **D. C., Wash.**—TERMINAL BLDG.—Pub. Bldgs. Admin., F St. between 18 and 19 Sts. N. W., Wash., 25, D. C., terminal bldg. exten.

† **Neb., Reno**—AIRPORT—U. S. Engr., 74 New Montgomery St., San Francisco, Calif., rehabilitation airbase facilities. Over **$200,000**.

● † **R. I., North Kingstown**—AIR STATION—Construction Officer, Pub. Wks. Dpt., Air Station, Quonset Point, commissary **$35,000**, repairing, sealing, etc. runways **$75,000**; plans by Charles A. Maguire & Assoc., 1018 Turks Head Bldg., Providence, 1 and 2 story, 200x525 ft. glass, steel shop for Navy Repair Work, Naval Air Station, **$2,225,000**.

PUBLIC BUILDINGS

Ala., Auburn — Alabama Polytechnic Institue, plans by Pearson, Tittle & Narrows, First National Bank Bldg., Montgomery, architectural bldg. **$500,000.**

●**Ark., Hot Springs**—Hot Springs School Bd., Hot Springs, bond election Mar. 18, 2 negro schools, **$1,250,000.**

●**Calif., Mill Valley and San Anselmo**—Tamalpais Union High School Dist., Mill Valley, voted **$2,045,000** bonds, bldgs. at Tamalpais Union High School in Mill Valley and 38-classroom high school in San Anselmo. Kump & Falk, 3 Main St., San Francisco, archts. CD 11/10—ENR 11/25.

●**Calif., Modesto** — Bd. Educ., 14 and I Sts., plans by Fred L. Swartz & Wm. G. Hybert, 27 Rowell Bldg., Fresno. Washington School, **$600,000** and Roosevelt School, **$600,000.** CD 11/1—ENR 11/11.

●**Calif., San Francisco**—Dpt. P. Wks., Bd. Educ., City Hall, plans by Harry A. Thomsen, Jr. & Aleck L. Wilson, 315 Montgomery St., Sunset Community Junior High School, **$2,400,000;** plans by Albert F. Roller, 1 Montgomery St., Ulloa School, Wawona and Vicente Sts., 41 and 42 Aves., **$900,000;** plans by John Lyon Reid, 417 Market St., Sunset Elementary "A" School, **$900,000;** plans by W. D. Peugh, 333 Montgomery St., Silver Ave. School **$750,000;** plans by William Clement Ambrose & Eldridge T. Spencer, 251 Kearney St., Sunnydale School, **$600,000;** plans by Hertzka & Knowles, 85 Post St., Fremont School, **$750,000;** plans by Masten & Hurd, 526 Powell St., Miraloma School, **$750,000;** plans by W. P. Day, 111 Montgomery St., Hillcrest School, **$600,000.** CD 10/6/44—ENR 10/19/44.

Calif., San Fernando—Bd. Supervs. Los Angeles Co., 501 Hall of Records, Los Angeles, plans by Breo Freeman, 28 S. Fair Oaks Ave., Pasadena, civic center bldg., library court rooms, sheriff's office, etc. **$285,000.**

Calif., Santa Monica—Bd. Supervs., Los Angeles Co. 501 Hall of Records, Los Angeles, plans by Robert Kliegman & Fred Barlen Crock, 3757 Wilshire Bldg., Los Angeles, 23,000 sq. ft. civic center, **$350,000.**

●**Conn., Hartford**—State Dpt. Mental Health, State Office Bldg., Hartford, home and hospital for children 6 to 15 years old, child study and treatment home for emotionally disturbed and mentally ill. **$1,700,000.**

●**Conn., Mansfield**—State Dpt. Mental Health, Hartford, patients dormitory, housing for employees power plant addn., Mansfield State Training School. **$2,245,000.**

●**Conn., Middletown** — State Dpt. Mental Health, Hartford, power plant, housing for employees, staff bldg., occupational therapy, Connecticut State Hospital. **$4,077,267.** CD 5/9/45—ENR 5/17/45.

†**Conn., New London**—U. S. Navy, Coast Guard Div., Coast Guard Academy, memorial chapel, Coast Guard Academy, **$500,000.**

●**Conn., Newton**—State Dpt. Health, Hartford, employees quarters, administration bldg., service bldg. and ATFF apartments, Fairfield State Hospital, **$1,550,000.**

●**Conn., North Haven**—Town, Joel P. Beach, first selectmen, Town Hall, 2 and 3 story, brick, steel high school incl. library offices, auditorium, **$2,500,000.**

Conn., Norwalk—City, Irving C. Freese, mayor, City Hall, brick, concrete municipal garage, maintenance equip. etc. **$125,000.**

●**Conn., Norwich**—State Dpt. Mental Health, Hartford, power plant, laundry, etc., Norwich State Hospital. **$1,250,000.**

Conn., Shelton—State Tuberculosis Comn., State Offices, Hartford, brick T. B. hospital, Laurel Heights. **$625,000.**

●**Conn., Southbury**—State Dpt. Mental Health, Hartford, employees dormitories, patients cottages, State Training School, **$1,580,000.** CD 8/13/47—ENR 9/4/47.

●**Fla., Miami**—Dade Co., plans by Steward & Skinner, 223 S. E. 1 St., Jackson Memorial Hospital addn. **$2,500,000.** CD 8/9/46—ENR 8/29/46.

Fla., Sarasota—Sarasota Bd. Pub. Instructions, Sarasota, plans by Albert Moore Saxe, Commercial Court Bldg., Junior High School, **$350,000. James** Stripling & Assoc., Child Bldg., Tallahassee, consult. engrs.

Ga., Atlanta—City Bd. Educ., City Hall, Henry Grady High School addn. **$400,000.**

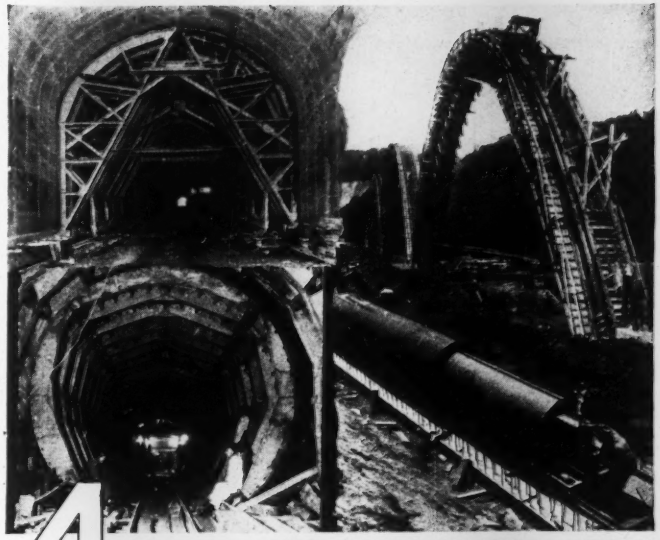
Idaho, Caldwell — School Bd., Caldwell, voted $280,000 bonds enlarging, remodeling Junior High School, **$210,000;** grade school addn., **$70,000.**

Ill., Bellwood—School Dist. 88, Bellwood, plant by L. N. Balluff, 35 E. Wacker Dr., Chicago, 2 story brick school addn. Approx. **$350,000.**

●**Ill., Chicago** — State of Illinois, Springfield, plans by C. Herrick Hammond, state archt., 53 W. Jackson Blvd., and Philip B. Maher, 157 E. Erie St., 8½ story, rein.-con., brick, stone tuberculosis hospital, in West Side Medical Center, of Medical Center Comn. **$5,000,000.** CD 9/10/47—ENR 9/18/47.

Ill., Herrin — Herrin Twp. School Dist., Z. C. Eckert, principal, Herrin, voted $150,000 bonds, brick, concrete, steel, stone high school. **$600,000.**

●**Ill., Highland Park**—Bd. Educ., Dist. 108, 495 Lincoln Ave., plans by Bertram A. Weber, 221 N. La Salle St., Chicago, school, **$1,250,000.** CD 3/7/46—ENR 5/30/46.



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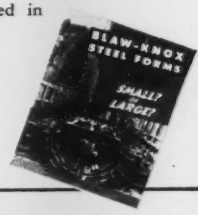

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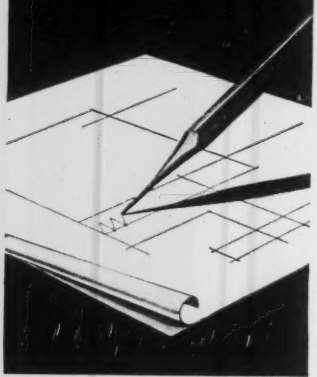

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●**Ind., Bloomington** — Bd. Trustees Indiana University, Bloomington, plans completed by McGuire & Shook, 1400-01 Fletcher Trust Bldg., Indianapolis, 4 story, 62 x 173 ft. and 47 x 66 ft. brick, stone, rein.-con. steel School of Education addn., **$1,250,000.** Bevington Tasgart & Fowler, 730 Indiana Pythian Bldg., Indianapolis, mech. engrs. CD 1/20/47—ENR 2/6/47.

Ky., Covington—Covington-Kenton County Tuberculosis Sanitarium, Judge Wm. Wehrman, Fiscal Court, Court House, plans by Howard McClory, 519 Main St., Cincinnati, O., tuberculosis sanitarium, Kyles Lane near Town of South Hills. **$400,000.** CD 10/2—ENR 10/7.

Mass., Amherst — University of Massachusetts. R. D. Hawley, plans by Appleton & Stearns, 53 State St., Boston, central engineering bldg. and wing, **$500,000.** Clifford T. Rhoades, 53 State St., Boston, engr. CD 9/14—ENR 9/30.

●**Mass., Boston** — P. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., federal bldg., Stuart St., between Trinity Pl and Clarendon St. **$28,500,000.** CD 11/5/45—ENR 12/13/45.

●**Mass., Chelsea** — City of Chelsea Housing Auth., George Tigar, chn., City Hall, 130-unit veterans housing. **$1,300,000.**

Mass., Danvers — Commonwealth of Mass., Dpt. Mental Health, 100 Nashua St., Boston, fireproofing, plumbing, heating State Hospital, **$627,000;** fireproofing and electrical addn., State Hospital Administration Bldg., **$250,000,** CD 7/19/45.

Mass., Dedham — Town, Bd. Selectmen, plans by Cram & Ferguson, 248 Boylston St., Boston, municipal bldg., railroad station, Over **$250,000.** CD 2/21/46—ENR 5/16/46.

Mass., Easthampton—Town of East Hampton Housing Auth., R. O'Brien, chn., 9 Northampton St., plans by Warner MacNeish, Archt'l & Engrg. Service, 1597 Main St., Springfield, 31-unit veterans housing. **$306,000.** CD 12/1—ENR 1/6.

Mass., Hull—Town Housing Auth., John A. Smith, chn., Hull, plans by Edward J. Shields, 1245 Hancock St., Quincy, 28 unit veterans housing, Central Ave. between C and D Sts. **$505,102.** CD 10/28—ENR 11/11.

Mass., Needham — Town, Housing Comn., Needham, plans by Emery, Wait, Smith Assoc., 92 State St., Boston, eighty 1 story houses, Veterans Housing. **$800,000.** CD 10/29—ENR 11/11.

Mass., Newton—City, School Dpt., City Hall, plans by Collens, Willis & Beckonert, 20 Newbury St., Boston, 2 story, brick Veterans Memorial Elementary School, Oak Hill Park, **$650,000.**

●**Mo., Independence** — City, Roger C. Sermon, mayor, City Hall, and Chamber of Commerce, Howard Bennett, pres., 2 story brick, concrete, stone President Truman Memorial Library, Museum and Community Bldg. **$3,500,000.** CD 8/26/43—ENR 9/2/43.

●**O., Columbus**—Ohio State Fairgrounds Comn., Columbus, Ohio, Stair Pitzer, consulting, 25 bldgs. and 24,000 auto parking space, bldgs. included are 20,000 seating capacity coliseum, state exhibit bldg., exhibit bldgs. for horses, sheep, poultry, cattle, swine, 4-H Clubs or Junior Fair, industrial exhibits, agricultural or horticultural exhibits, women's and school exhibits, various services, dormitories, hospital, fire, police, post office, bus terminal, recreation grandstand, race track and horse barns, on 523 acre site north of Ohio State University. **$11,700,000.** Yost, Ivers, Seamon & Assoc., 2nd Natl. Bank Bldg., Cincinnati, consult. engrs. CD 8/20/45—ENR 9/6/45.

Okla., Ardmore—Planning & Resources Bd., Capitol, Oklahoma City, plans by Harold Flood, Ardmore, lodge and 50 cabins at Lake Murray, **$800,000.** Hudgins, Thompson & Ball, 1100 W. Main St., Oklahoma City, consult. engrs. CD 10/29/47—ENR 11/13/47.

Pa., Elwyn—Elwyn Training School, Elwyn, school, **$825,000.**

Pa., Homestead—Homestead School Dist., Homestead, school addn., athletic field and bleachers, **$511,734.** Wm. J. Finley, State Capitol, Harrisburg, dist. engr. CD 10/24/46—ENR 11/14/46.

Pa., Meadville — School Dist. of West Meade, Meadville, plans by Edward J. Weaver, 3292 Chestnut St., 2 story, 80x112 ft., brick school, West Meade Twp., near here, **$250,000.**

Pa., Spry — York Twp. Bd. Educ., Charles P. Markey, secy., R. D. 2, York, plans by Clair S. Buchart, 611 W. Market St., York, school, **$250,000.**

Pa., Waymart — Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, tuberculosis hospital at Fairview State Hospital, **$600,000.** A. F. Jones, c/o owner, engr.

●**R. I., Cranston**—City, C. W. Bosworth, supt. Schools, plans by Howe, Prout & Ekman, 1014 Turks Head Bldg., Providence, brick, steel, concrete school, Arlington Sect., incl. swimming pool, **$950,000;** plans by Greer, Kent, Mather, Cruise & Aldrich, 423 Industrial Trust Bldg., Providence, 2 story, bsmnt., brick, steel school, Chestnut, Oaklawn and Glenwood Aves., Eden Park School, Auburn Sect. **$450,000.** CD 1/9—ENR 1/22.

R. I., Exeter—State, F. A. Adams, State Bldg., Providence, plans by Conrad Greene, 32 Westminster St., Providence, brick, steel administration bldg. and service bldg. alterations, **$250,000.** Milton MacIntosh, 761 Park Ave., Cranston, consult. archt.; plans by Linwood A. Gardiner, 170 Westminster St., Providence, employees dormitory and houses for the staff, $275,000. Samuel Morino, 108 Clarendon Ave., Providence, consult. archt.; plans by Barker & Turoff, 10 Weybosset St., Providence, brick laundry addn., **$50,000,** pipeline imprvs., utilities, etc, **$150,000,** Hayden Harding & Buchanan, 662 Park Square Bldg., Boston, Mass. consult. archts., above work at the State School for Feeble Minded. CD 4/16—ENR 4/29.

●**R. I., Kingston**—State Dpt. Educ., State House, Providence, plans by Oresto Di Saia, 703 Gardiner Bldg., Providence, brick, steel, concrete armory-gymnasium, Rhode Island State College. **$1,255,400.** CD 10/18/45—ENR 11/15/45.

●**Tex., El Paso**—College of Mines & Metallurgy, W. Kerbey Administration Bldg., engineering bldg., **$250,000;** auditorium, **$450,000;** science bldg., **$350,000.**

●**Tex., Houston**—Texas State University for Negroes, c/o Bd. Control, Capitol Bldg., Austin, plans by R. L. White, university archt., 104 E. 13th St., Austin, library, **$1,000,000;** science, **$1,500,000;** women's dormitory, **$1,-$250,000;** men's dormitory, **$1,250,000;** graduate school, **$400,000;** law bldg., **$250,000;** misc. bldgs., incl. water, sanitary sewer, paving, misc. pipe work sys., **$800,000;** medical laboratory, **$750,000;** medical admin. and classroom, **$500,000,** on 53 acre plot off 4200 block Wheeler St. CD 7/22/46—ENR 8/1/46.

●**Wash., Cheney** — Eastern Washington College of Education, Cheney, plans by George M. Rasque, Washington Trust Bldg., Spokane, women's residence hall, **$700,000;** men's residence hall, **$300,000.**

Wash., Ellensburg—School Bd., Ellensburg, school, **$351,078.**

Wash., Oakesdale—School Bd., Oakesdale, high school, shops, gymnasium, **$340,000.**

●**Wash., Seattle**—University of Washington, E. 45 St. and 17 Ave. N. E., Zone 5, mechanical engineering bldg. **$1,500,000;** library wings and stacks, **$2,490,000;** industrial arts wing for fine arts bldg. **$340,000;** first unit of auditorium-museum group, **$2,500,000;** University Press portion of new journalism bldg. **$350,-000;** journalism bldg. **$693,000;** speech bldg. **$850,000.** CD 3/17/48—ENR 4/1/48.

Wis., Eau Claire — Eau Claire Co., Eau Claire, plans by E. F. Klinger & Assoc., engrs. and archts. 218 S. Barstow St., sanatorium annex. **$300,000.**

●**Wis., Madison**—Bd. Vocational & Adult Educ., Madison, plans by Law, Law, Potter & Nystrom, 121 S. Pinckney St., 4 story Vocational School addn. **$1,000,000.** CD 2/13/45—ENR 2/22/45.

●**Wis., Madison** — Madison General Hospital, 923 Mound St., plans by Law, Law, Potter & Nystrom, 121 S. Pinckney St., Jackson Reuter home for aged and chronically ill. **$1,028,087.** Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, Ill., assoc. archts.

●**Alaska, Anchorage**—School Bd., Anchorage, plans by W. A. Johnson, Everett, Wash., 3 schools. **$1,600,000.** CD 2/4—ENR 2/17.

●**Newfoundland, St. Johns**—Central Mortgage & Housing Corp., 588 Gottingen St., Halifax, N. S., 300 houses. Approx. **$2,100,000.** J. P. Mangan, c/o owner, engr.

Ont., Chesley—Chesley School Bd., G. W. Grabb, town clk., rebuilding 2 story, brick school to be used as combined high school and public school. Approx. **$500,000.** CD 6/14/46—7/25/46.

●**Que., Montreal**—Protestant Central School Bd., 3460 McTavish St., Somerled High School, **$2,275,702,** school, Van Horne Ave., **$871,495.**

●**Que., Mount Royal (Postal Dist. Montreal)**—Protestant Central School Bd., 3460 McTavish St., Montreal, high school, **$1,500,000.** CD 6/6/47—ENR 6/26/47.

●**Que., Rosemount (Postal Dist. Montreal)**—Protestant Central School Bd., 3460 McTavish St., Montreal, high school, **$1,762,590.** CD 2/5/47—ENR 2/20/47.

COMMERCIAL BUILDINGS

Calif., Long Beach—First Baptist Church of Long Beach, Long Beach, plans by Kenneth S. Wing, 20 Linden Ave., 2-story, rein.-con. church, 10 and Pine Aves., **$750,000.**

●**Calif., San Jose**—Komsthoeft & Dennee, 600 W. San Carlos St., 145 two and three bedroom homes in Beverly Addition. **$1,757,000.**

●**Calif., San Mateo**—Newbridge Park Realty Co., 180 N. Bayshore Blvd., 1800 residences on site of old Emma Rose Estate, **$30,000,000.**

●**Calif., San Rafael**—De Luca & Son, 1745 Filbert St., San Francisco, 80 luxury homes, Coleman Dr., and bordering Robert Dollar Park. **$1,650,000.**

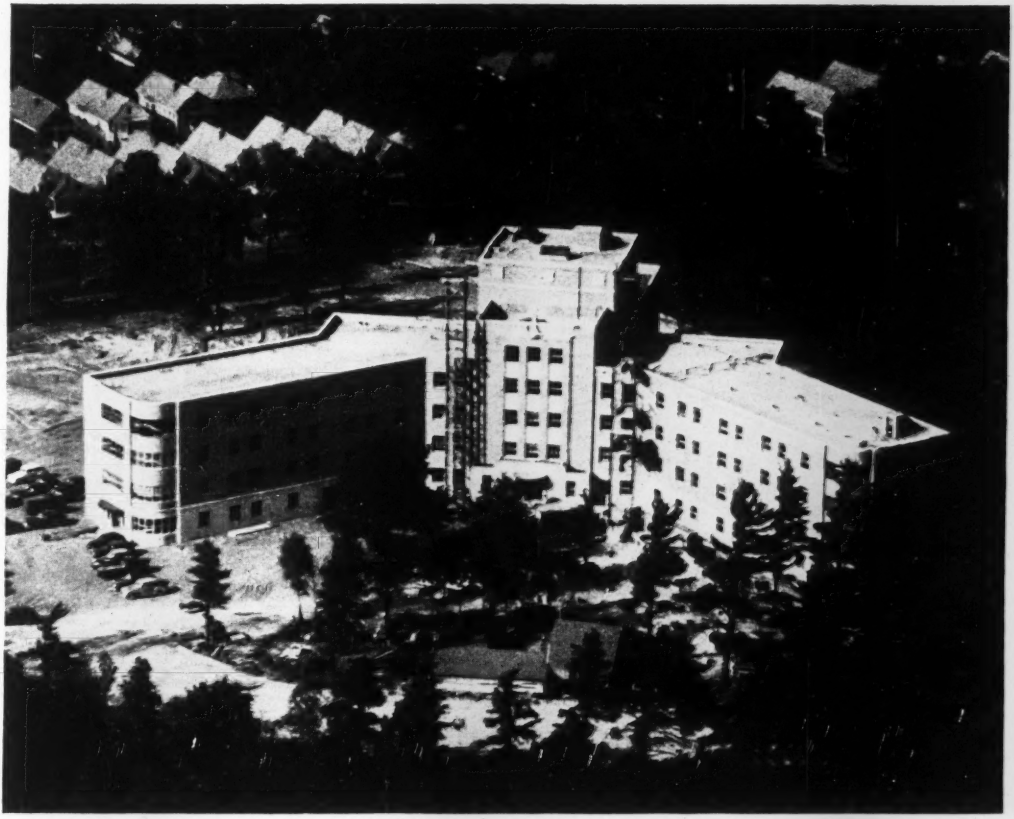
Conn., Hartford—Scottish Rite Foundation, Edward M. White, Suffield, brick, steel, stone masonic orders fraternal hall. **$500,000.**

Del., Wilmington—Wilmington General Hospital, Broome and Chestnut Sts., preliminary sketches by G. Morris Whiteside, 2nd, 2162 du-Pont Bldg. hospital kitchen and laboratory addn. **$250,000;** hospital addn., **$500,000.**

●**D. C., Wash.**—Washington Hebrew Congregation, 822 8 St. N. W., plans by Eric Medelsohn, 627 Commercial St., San Francisco, Calif., temple community center, **$1,000,000.** Isadore Thompson, 58 Sutter St., San Francisco, Calif., engr. CD 10/8—ENR 10/21.

Fla., Miami—Medical Square c/o Edwin T. Reeder, archt., 1777 Biscayune Blvd., 14 story office. Over **$500,000.**

(Continued on page 98)



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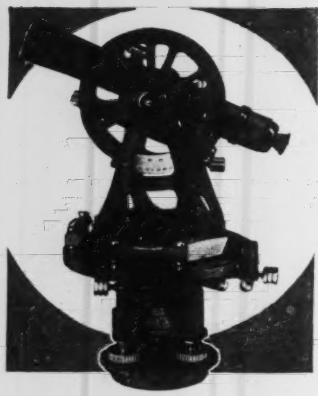

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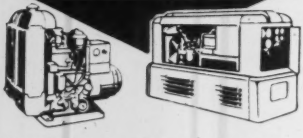

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(Continued from page 96)

●**Ill., Springfield** — Springfield Amvet Homestead Assn., Springfield Post 61, c/o Ronald A. Ferguson Assoc., archts. and engrs., 1820 Central Parkway, Cincinnati, O., 300 unit veterans housing, 110 acre plot, southwest of here, **$3,000,000.**

Mass., Cambridge—Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, plans by Perry Shaw & Hepburn, 21 St James Ave., Boston, hydrodynamics laboratory, **$550,000.** CD 1/4—ENR 1/20

Mont., Livingston — Community Hospital Assn., Livingston, plans by Cushing & Terrell, 222½ N. Broadway, Billings, 2 story, bsmnt., 150 x 165 ft., T shaped, reinf. con. brick hospital **$600,000.**

●**N. J., Flemington**—New York University Bellevue Medical Center, 477 1st Ave., New York, N. Y., 125-bed hospital, community health center and nurses school, **$2,000,000**

●**N. M., Albuquerque**—Lovelace Foundation for Education and Medicine Research, c/o Dr. W. R. Lovelace, Albuquerque, plans by John Gaw Meem, Hugo Zehner & Assoc., Box 628, Santa Fe, 4 story, reinf. con. hollow tile clinic **$1,000,000.**

N. Y., Bellerose—Post Gardens, Inc., c/o A. H. Salkowitz, archt., 37-60 82 St., Jackson Heights, 59 houses on 6 acre site between 80 and 81 Aves. and 258 and 260 Sts. **$600,000.**

●**N. Y., Brooklyn**—P. M. L. Co., 16 Court St., Zone 2, plans by Kavy & Kavovitt, Inc., 44 Court St., Zone 2, two 6 story apartments, at 164 and 167 71 St. **$1,640,000.**

N. Y., Hollis—F. Stark, c/o M. M. Elkind, archt., 46-09 82 St., Jackson Heights, 5 multiple dwellings, Jamaica Ave. near 187 St. **$250,000.**

N. Y., Rego Park — Lasarai Gardens, Inc., c/o H. Herbert Lilien, archt., 201 W. 72 St., New York, Zone 23, apartment, 64 Ave. near 102 St. **$800,000.**

N. Y., Rosedale — Springfield Estates, c/o Stanley H. Klein, archt., 90-04 161 St., Jamaica, 5 apartments at 222, 223, 135 and 137 Aves. **$558,700.**

●**O., Youngstown**—Bruce M. Weinhold, Marhill Markets, 4816 Market St., shopping center between Market and Hillman Sts. south of Ravenwood Ave. **$1,000,000.**

●**Okla., Oklahoma City**—Oklahoma Apartment Co., c/o American First Trust Co., 120 N. Rob. St., 19 story apartment hotel with 100 own your own apartments N. W. 36 and Classen Sts. **$2,000,000.** Russell B. Friess, Hightower Bldg., consult. engr.

Okla., Oklahoma City—St. Lukes Methodist Episcopal church, 201 N.W. 8 St., plans by Sorey, Hill & Sorey, First Natl. Bldg., building, N.W. 14 and Harvey Sts. **$800,000.** CD 12/16/46—ENR 12/26/46

●**Pa., Bryn Athyn**—Academy of The New Church, Bryn Athyn, rebuilding school, **$1,000,000.** Knappen Eng. Co., 280 Madison Ave., New York, N. Y., consult. engr. CD 4/26/46—ENR 7/4/46, under Public Buildings.

Pa., Pittsburgh—Pennsylvania College for Women, Woodland Rd., plans by Ingham, Boyd & Pratt, 1213 Empire Bldg., brick dining hall and administration bldg., **$500,000;** 2 story, 60x120 ft., brick, tile, steel gymnasium, **$300,000.** CD 6/21/46—ENR 7/4/46.

●**R. I., North Providence**—Mother Cabrini Hospital, Bishop of Providence Diocese, Fenner St., Providence, plans by John F. Hogan, 185 Westminster St., Providence, 3 story, basmt., brick steel hospital and nurses home, High Service Ave. **$1,000,000.**

Tex., Bellaire—J. S. Norman Bldg. Corp., 4815 Richmond Rd., Houston, addnl. housing in Norman Addn. of Bellaire sect. **$700,000.**

●**Tex., Houston**—Ayrshire Corp., 6825 Academy St., addnl. housing, **$2** dwellings in various sects. of Iowa **$2,225,000.**

●**Tex., Houston** — Best Home Builders, Inc., J. E. Leicher & Assoc., 2402 Arbor St., plans by Jack W. Knostman, 2017 W. Gray St., 500 dwellings, **$3,000,000;** shopping center, **$450,000,** off Old Spanish Trail and Holmes Rds. near Magon Park.

Tex., Houston — Jess Little, 2620 Midland St., housing, on 50 acre tract, south of Braes Heights on west side of Main St. Approx. **$500,000.**

●**Tex., Houston**—Oak Forest Constr. Co., c/o P. S. Luttrell, 2230 Albans St. or 2203 Rosslyn St., plans by Wilson, Morris & Crain, 3212 Smith St., 337 dwellings, part of Sect. 3 of Oak Forest **$3,000,000.**

●**Tex., Houston** — Sears, Roebuck & Co., 4207 Main St., plans by George L. Dahl, 1920½ Main St., Dallas, 150,000 sq. ft. mercantile store, N. Shepherd Dr. between 42 and Garden Oaks Blvd. **$1,250,000.** CD 11/11—ENR 11/25.

●**Tex., Houston** — Texas Medical Center, 2017 W. Gray St., plans by C. A. Johnson & H. E. Maddox, Jr., 3501 Buffalo Dr., central administration and clinic, **$2,225,000.** Thomas F. Ellerbe & Co., E. 505, 1st. Natl. Bank Bldg., St. Paul, Minn., consult. engrs.

●**Tex., Houston**—Westview Corp., c/o W. C. Perkins, 4110 Crane St., 218 dwellings, Westview Terrace between Katy and Hempstead Rds. on Silber, **$1,308,000.**

Tex., San Antonio—Texas Development Co., c/o Mrs. N. Straus Nayfach, Alamo National Bldg., housing, in Jefferson Dist. **$325,000;** in Perrell Heights **$375,000.**

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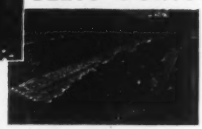

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●**Tex., Waco** — Providence Hospital (Daughters of Charity of St. Vicinte DePaul, Waco, plans by Maguolo & Quick, 4908 Delmar St., St. Louis, Mo.; Harry L. Spicer, 1514 Amicable Bldg., and Walter C. Cocke, 1507 Franklin St., 5 story, basmt., 155x169 ft., brick, hollow tile concrete 110 bed hospital addn., incl. air-conditioning, **$1,059,000.** Zumwalt & Vinther, Mercantile Bank Bldg., Dallas, engrs. CD 7/28/48—ENR 8/5/48.

●**Wash., Pasco**—Seattle—Tacoma Land Co. 613 3 Ave. N., Seattle, 124 houses. **$1,000,000.**

Wash., Puyallup — Lutheran Minor Chronic Disease Hospital, Puyallup, hospital. **$275,000.**

Wash., South Bend — Willapa General Hospital, South Bend, hospital. **$540,000.**

INDUSTRIAL BUILDINGS

Ark., Little Rock — FACTORY — Arkansas Farm Bureau Co-operative, c/o Joe Hardin Grady, plans by Utility Sales & Eng. Co., Atlanta, Ga., fertilizer factory, **$600,000.**

●**Ark., Ozark**—PLANT—Arkansas Electric Co-operative, Ozark, steam generating plant. **$5,480,000.**

Calif., Culver City—PLANT—Hughes Aircraft Co., Culver City, plans by H. L. Gogerty, 3123 W. 8 St., Los Angeles, $1,000 sq. ft., steel frame plant addn. **$500,000.**

●**Calif., Los Angeles** — MART — Los Angeles Furniture Mart Bldg. Co., Inc., 210 W. 7 St., plans by Heitschmidt & Matcham, 449 S. Beaudry St., 12 story, 2,000,000 sq. ft. furniture mart bldg. **$10,000,000.** Beatty & Clar, 1121 S. Hill St., consult. engrs.

Ill., Melrose Park — PLANT—Benjamin Moore & Co., 415 N. Green St., Chicago, plans by Niestadt & Love, 407 S. Dearborn St., Chicago 4 unit plant, boiler house, North Ave. and 25 St. **$880,000.**

Ill., Skokie—PLANT—Mathias Klein & Sons, 3200 W. Belmont St., Chicago, plans by Wm. C. Wright, 7 S. Dearborn St., Chicago, 1 and 2 story, brick, concrete, stone, steel plant, Touhy Rd. and McCormick Blvd. **$800,000.**

●**Kan., Kansas City**—PLANT—Colgate-Palmolive-Peet Co., 105 Hudson St., Jersey City, N. J., plans by Albert Kahn Assoc. Architects & Engineers, Inc., engr. and archt., 345 New Center Bldg., Detroit, Mich., plant. Over **$2,000,000.** CD 2/3—ENR 2/17.

●**Minn., Minneapolis** — PLANT — Northern States Power Co., 15 S. 5 St., A. S. Keely, constr. supt., 60,000 kw. generating plant, Lyndale Ave. S. at Minnesota River. **$10,000,000.**

N. Y., New York—GARAGE—Hillman Housing Corp., 504 Grand St., plans by George W. Springsteen, 92 Liberty St., garage alterations, 24-26 Columbia St. **$130,000.**

●**Pa., Pittsburgh**—RAILROAD TERMINAL—Pennsylvania R. R. Co., J. L. Greasatt, ch. engr., Broad St. Station Bldg., 1617 Pennsylvania Blvd., Phila., Zone 4, plans by McKim, Mead & White, 100 Park Ave., New York, N. Y., platform and exits on Liberty Ave. at 13 St. and 1 story, brick, tile shelter over tracks, approx. ¼ mi. long, 16 tracks in width, switch controls, signals and communications, ramps, renovating waiting rooms. **$14,000,000.** CD 10/31/46—ENR 11/14/46.

●**Tex., Houston**—PLANT—Phillips Petroleum Co., c/o K. S. Adams, pres., Bartlesville, Okla., outbound bulk chemical handling plant. **$1,250,000.**

●**Ont., Hamilton** — BLAST FURNACE—Dominion Foundaries & Steel Ltd., Depew St., 500 ton blast furnace, incl. auxiliary equip., coke ovens. Approx. **$15,000,000.** A. J. Boynton & Co., 54 E. Washington St., Chicago Ill., U. S. A., engrs.

Que., Montreal—PLANT—Chas. Cusson Ltd., 284 Ontario St. W., plant, Cote des Liene Rd. **$500,000.**

●**Que., Montreal**—PLANT—E. Gagnon, 3939 Rivard St., 100x200 ft. plant. **$1,000,000.**

UNCLASSIFIED

●**Calif., San Diego**—GAS PIPELINE, etc.—San Diego Gas & Electric Co., 861 6 Ave., 60 mi. 16 in. gas pipeline, **$3,100,000;** 40,000,000 cu. ft. storage plant **$1,300,000;** electric transmission line, **$900,000;** generating unit, **$2,750,000.** CD 2/5—ENR 2/20.

●**Iowa**—RURAL DISTRIBUTION LINES—South-East Iowa Co-operative Electric Assn., Mt. Pleasant, rural distr. lines, Perry Co. **$1,378,000.** Stanley Eng. Co., Muscatine, consult. engr.

●**North Dakota** — RURAL DISTRIBUTION LINES—Burke-Divide Electric Corp., Columbus, 1,100 mi. rural distr. lines and completing previously approved constr., Burke Co. **$1,640,000.** CD 1/28/48—ENR 2/19/48.

●**North Dakota** — RURAL DISTRIBUTION LINES—Sheyenne Valley Electric Co-operative, Finley, **$1.8** mi. rural distr. lines, sys. imprvs. and completing previously approved constr., Steele Co. **$1,230,000.** CD 3/2/48 — ENR 3/18/48.

●**Ohio**—CONVEYOR BELT—Riverdale Belt Conveyor Lines, Inc., c/o H. B. Stewart, Jr., Akron, Canton & Youngstown R. R. Co., 12 Exchange St., Akron, Zone 8, two-way 130 mi. conveyor belt from Lorain to Lake Erie-East Liverpool on Ohio River. **$154,000,000;** terminal facilities, **$56,000,000.**

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CONSTRUCTION REPORTS—Second Section

Third Section Construction Reports on page 112

WATER SUPPLY

BIDS ASKED

March 10

Tex., Hallettsville — City, J. G. Traxler, mayor, water supply well, $301,000.

March 11

Tex., Luling—City, J. N. Brignance, mayor, water distr. sys. $80,000. Marvin Turner Engineers, 918 Littlefield Bldg., Austin, engrs. (**Correction**—location of project.). CD 2/23 under Tex., Lufkin.

March 14

Alta., Edmonton—City Comrs., City Hall, 1,300 lin. ft. 12 and 20 in. steel watermains, for Municipality. Plans deposit $20. CD 3/2/48—ENR 3/18/48.

March 15

Fla., Lantana—Florida State Tuberculosis Bd., P. O. Box 1845, Delray Beach, elevated steel water tank for new hospital under constr. Plans deposit $5.

Ga., La Grange—City, filtration plant, river pump station and distr. sys. extens. Wiedeman & Singleton C. & S. National Bank Bldg., Atlanta, engrs. CD 3/6—ENR 3/12.

Miss., Verona—Town, Town Hall, water well, elevated water tank, distr. sys. extens. Plans deposit $10., Leland B. Cook, P. O. Box 290, Tupelo, engr.

Va., Clintwood—Water Comm., Town of Clintwood, Div. I, drilling deep wells, incl. casing, grouting and testing wells. Plans deposit $20. Wiley & Wilson, 905 Peoples Bank Bldg., Lynchburg, consult. engrs.

LOW BIDDERS

Ill., Oak Forest — Bd. Comrs. Cook Co., County Bldg., Chicago, rein.-con. water reservoir, from Republic Constr. Co., 30 N. Dearborn St., Chicago, **$123,000.** R. F. Houlihan, 30 N. Dearborn St., Chicago, archt.

N. C., Albemarle—City, W. H. Morrow, mayor, Feb. 19, installing water distr. mains from H. W. Alward, Inc., Bernardsville, **N. J., $201,912**; valves, from Grinnell Co., 1431 W. Morehead St., Charlotte, **$38,190**; pipe, from Clamorgan Pipe & Foundry Co., Lynchburg, Va., **$375,601.** CD 1/19—ENR 1/7.

Tex., Stephenville—City, R. M. Pittman, mayor, Feb. 15, elevated steel water tank, from Pittsburgh-Des Moines Steel Co., Praetorian Bldg., Dallas, Design 1 **$59,525**, est. $50,000. CD 1/13—ENR 1/27.

CONTRACTS AWARDED

Conn., New Britain—City, P. Wks. Dpt., City Hall, watermains in various sections, **$150,000.** Owner builds. George Molleur, City Hall, city engr.

Ga., Lyerly—Town, WW improv., to J. B. McCrary Co., 22 Marietta St. Bldg., Atlanta, **$60,050.**

La., Rayne—City, L. Baleneaux, mayor, City Hall, water reservoir, distr. lines, to Mackie & Constr. Co., 220 N. 3 St., Baton Rouge, **$46,961.** Bids 2/8. CD 2/2.

S. C., Newberry—City, Comr. P. Wks., W. R. Wise, mgr.-engr., Newberry, filtration plant and raw water pump stations, to Crosby Constr. Co., Inc., Union, **$98,500.** Bids 2/16. CD 1/11—ENR 1/13.

Tex., Baytown—W. L. Jones & Son, c/o Greens Bayou, Houston, c. i. water lines, own forces, **$45,000.** CD 5/13—ENR 5/20.

Tex., Houston—W. E. Sampson & E. Phil Gimmer, 2305 Milam St., c.i. waterlines and drainage, own forces, **$60,000.** CD 4/23/47—ENR 5/1/47.

Tex., San Antonio—E. J. Burke & Sons, 4220 S. Zarzamora St., c. i. water lines, facilities, adjacent to Highland Hills, force account, **$60,000.**

SEWERS, WASTE DISPOSAL

BIDS ASKED

March 7

Mass., Framingham—Town, Comr. P. Wks., Memorial Bldg., sewage pump. station, substructure and superstructure, Lokerville Station, Contr. 2, $100,000. Plans deposit $10. Haley & Ward, 13 Tremont St., Boston, engrs.

March 9

Md., Baltimore—Mayor & City Council, City Hall, 36 x 52 x 94 ft. brick, concrete, Jones Falls Sewage Pumping Station. Plans deposit $5. John J. Hunt, sewerage engr. CD 11/16—ENR 11/18.

March 11

Ga., Augusta—City, c/o John D. Twiggs, engr., Augusta, 60 in. rein.-con. storm sewers in Grove St. from Broad St. to sand trap at canal; 24 in. concrete storm sewer in Ellis St. from Rye St. to Milledge Rd.; 24 in. concrete storm sewer in Druid Park Ave. from Walton Way to Tubman St.; 24 in. concrete storm sewer in Green St. from Metcalf St. to Milledge Rd. CD 12/9—ENR 12/23.

Pa., Phila.—Dpt. P. Wks., Thomas Buckley, dir., City Hall Annex, Schedule A, East Central Schuylkill Intercepting Sewer from point about 450 ft. east of 34 St. to point in 26 St. North of Lombard St., Contr. SD 116 SW. CD 11/24/44—ENR 12/14/44.

March 12

Alta., Trochu—R. Ferguson, c/o Davis & Assoc., engrs., Bliss Bldg., West Calgary, sewerage sys., for Municipality. Plans deposit $10.

Calif., Sacramento—Sacramento Co., Courthouse, pump plant and force main for Sanitary Dist. 2, over $50,000. Plans deposit $10. Joseph Spink, Calif. Fruit Bldg., engr. CD 3/2/47—ENR 3/8/47.

●N. Y., Long Beach—City Clerk, City Hall, West Park Ave., sewage disposal plant imprvs. $1,000,000. Plans deposit $20. Clarence MacCallum, 299 Main St., Port Washington, engr.

N. Y., New York—President Manhattan Boro, Municipal Bldg., Zone 7, reconstructing sewers in Amsterdam Ave., W. 72 to W. 75 Sts.; W. 75 St., Amsterdam to Columbus Aves.; Columbus Ave., W. 75 to W. 77 Sts.; W. 77 St., Columbus Ave. to Central Park West. Contr. No. 81. Plans deposit $20. CD 9/21/44—ENR 10/5/44.

Wis., Hartford—City, sewage treatment plant addn. Plans deposit $25. J. Donohue Eng. Co., 608 N. 8 St., Sheboygan, engr. CD 3/17/48—ENR 3/25/48.

About June 1

●Ill., Springfield—City, City Hall, sewer project, $1,125,000. Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., engrs. CD 2/11—ENR 3/3.

LOW BIDDERS

Calif., Armona—Armona Sanitary Dist., 609 Lina St., Feb. 11, sanitary sewers, disposal plant, from Valley Trenching Co., Box 669, Turlock, **$104,531.** CD 1/24—ENR 2/3.

Calif., Los Angeles—City, P. Wks., 152 City Hall, Feb. 16, storm drain in Avon St. and Avon Park Terrace to Echo Park Ave., from Charles T. Brown C. & Paul Yukich, 1955 6 St., San Fernando, **$121,518.** Est. over $50,000.

Calif., Rockaway Beach—Ocean Shore Sanitary Dist., Rockaway Beach, received no bids Feb. 16, ocean Shore sewerage sys. incl. sewers, treatment plant and outfall sewer. Res. No. 9. Over $50,000. CD 1/26—ENR 2/3.

Conn., Broad Brook—Broad Brook Sewer Dist., Town Hall, Feb. 11, sewerage treatment plant, and sanitary sewers, from E. R. McGuirk, Inc., 355 Barbour St., Hartford, **$81,900** and **$166,630** respectively. CD 1/25—ENR 1/27.

Pa., Collegeville—Ursinusa College, Collegeville, sewage treatment plant, from Tri-County Constructors, High School Rd. and Harrison Ave., Elkins Park, **$52,086.** CD 1/25/45—ENR 2/1/45.

Tex., Dallas—City, Earl Goforth, secy., Feb. 16, sanitary sewers Mimosa, Glendora, Meadow and Waggoner Sts., from O. J. Parrott, Lawnview and Sevene Rds., **$57,715,** Est. $64,000. CD 2/14—ENR 2/17.

CONTRACTS AWARDED

Calif., Orange—Jennie A. Crutcher Foundation, Inc., c/o Stiner Boyle, archt., 328 Spurgeon Bldg., Santa Ana, sanitary sewerage sys. and water sys. in Tract 1237, to R. A. Wattson Co., 5528 Vineland Ave., Los Angeles, **$76,603.** Bids 2/2, awarded 2/8.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	

Unclassified

Stages Reported

PROPOSED WORK. Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

+	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

Calif., San Diego—City Council, Civic Center sanitary sewers in Moreno Blvd., Weeks Ave. and Naples St., Savannah, Naples Pl., etc., to L. B. Butterfield, 2935 Main St., **$147,901.** Awarded 2/8. Alden K. Fogg, city engr.

●D. C., Wash.—Govt. Dist. of Columbia Director of Sanitary Eng., District Bldg., 14 St. and Pennsylvania Ave. N. W., Zone 4, preliminary sedimentation and sludge digestion tanks, sewage treatment plant extens., Blue Plains, to Progressive Builders, Inc., Crescent Blvd. and Norwood Ave., Pennsauken, N. J. **$1,267,163.** Bids 1/13, awarded 2/15. CD 1/17—ENR 1/20.

Ga., Valdosta—City, Proj. 2, sanitary sewers improvs., to J. B. McCrary Co., 22 Marietta St. Bldg., Atlanta, **$128,600.** Bids 2/16. CD 1/25—ENR 1/27.

La., De Ridder—City, City Hall, sewage treatment plant, to S. J. Lemoine & Co., P. O. Box 181, Bunkie, **$64,188.** Bids 2/14. CD 2/2.

Md., Baltimore—Mayor & City Council, City Hall, Furnishing, installing electric and mechanical equip. in Brooklyn Sewage Pumping Station, Contr. 340, to Dravo Corp., 100 N. Eutaw St., **$174,648.** Bids 2/9, awarded 2/16. CD 2/16—ENR 2/24, under LB.

Mass., North Brookfield—Town, Bd. Selectmen, Town Hall, sewage disposal plant, incl. Imhoff tank, grit chamber, trickling filter chlorination and sedimentation, Farm Rd. and Gilbert St., to Dowgilewicz Bros., Inc., Spencer, **$61,241.** Tighe & Bond, 189 High St., Holyoke, engrs. CD 4/4/46—ENR 4/11/46.

Neb., Cambridge—City, sewers, to Beal Constr. Co., Brule, **$58,310.** Est. $69,793. Bids 2/8. P. W. Mousel, 3316 S. 29 St., Lincoln, engr.

N. C., Marion—Clinchfield Mfg. Co., Marion, sewage treatment plant, to Fisk-Carter Const. Co., Greenville, S. C. Bids 2/15. CD 2/15—ENR 2/17.

Pa., Chester—Scott Paper Co., foot of Market St., industrial waste treatment plant, own forces. **$250,000.** Christian L. Subert, 222 Willow Ave., Camp Hill, consult. engr. CD 10/24/45—ENR 11/15/45.

S. C. Newberry—City, Comr. P. Wks., W. R. Wise, mgr.-engr., Dr. H. B. Senn, chn., sewage treatment plant, to Joseph W. Barnwell, Columbia, **$145,008;** sanitary sewerage sys. extens., to Doyle Const. Co., Sumter, sanitary sewer, **$94,335.** Bids 2/16—CD 1/11—ENR 1/13.

Tex., Baytown—W. L. Jones & Son, c/o Greens Bayou, Houston, sanitary and storm sewers, own forces. **$70,000.** CD 5/13—ENR 5/20.

Tex., Houston—W. E. Sampson & E. Phil Gimmer, 2305 Milam St., sanitary sewer in Riversideicest, Sects. 1 and 2, own forces. **$63,000.**

Tex., San Antonio—E. J. Burke & Sons, 4220 S. Zarzamora St., sanitary sewers adjacent to Highland Hills, force account **$75,000.**

Utah, Salt Lake City—Utah State Bldg. Bd., State Capitol, sewage disposal plant, to Hansen-Niederhauser Co., 1479 Major St., **$53,800***** steam plant, to Palmer & Christiansen Plumbing & Heating Co., 233 W. 13 South St., **$135,586.** Bids 1/7. Ashton, Evans & Brazier, Beneficial Life Bldg., archts. Dr. Emile Waltzing, c/o owner, supt. of Constr.

Wash., Chehalis—City, City Hall, sewage treatment plant, to C. F. Davidson Co., Provident Bldg., Tacoma, **$163,077.** Stevens & Koon, Spalding Bldg., Portland, Ore. engrs. CD 9/17—ENR 9/12/47.

Wis., Milwaukee—City, combined sewers, N. 29 St. to F. A. Coli Co., 5230 W. State St., Milwaukee, Zone 8 **$53,633.** Bids 2/11, awarded 2/15.

BRIDGES

BIDS ASKED

March 11

Ont., Perth—W. L. Dickson, engr., County Bldg., steel, concrete bridge, for **Lanark Co.** Plans deposit $10.

March 14

Calif., Martinez—Contra Costa Co., Hall of Records, bridge across Dutch Slough at Jersey Island on County Rd. E-16 Over $50,000. Plans deposit $25. Joseph W. Berkley, Hall of Records, engr.

Miss., Gulfport—Harrison Co., c/o Co. Engr., Courthouse, Bayou Portage Bridge, Plans deposit $25.

LOW BIDDERS

California—State Div. Hys., State Bldg., Los Angeles, Feb. 17, rein.-con. box girder overcrossing and grade, b. conc. and c. conc. surface approaches on Hollywood Parkway at Edgeware Rd., Los Angeles Co., from J. E. Haddock, Ltd., 3578 Foothill Blvd., Pasadena, **$118,698.** CD 1/24/—ENR 1/27.

Idaho—State Hy. Dpt., Boise, Feb. 18, 381 ft. bridge over Snake River, Bingham Co., from Brennan & Cahoon, Pocatello, **$101,957.** Est **$98,702.** CD 2/9.

Massachusetts — Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Feb. 15, 2 steel stringer bridges, W. Grove St., Middleborough, from The Henley-Lundgren Co., 193 Hartford Pike, Shrewsbury, **$178,084.** CD 2/11

North Carolina—State Hy. & Pub. Wks Comn., Raleigh, Feb. 22, structures 1.6 mi. U. S. 74, from point on U. S. 74 approx. 0.5 mi. west of Mooresboro, east through Mooresboro to east

Calif., San Diego — City Council, Civic Center sanitary sewers in Moreno Blvd., Weeks Ave. and Naples St., Savannah, Naples Pl., etc., to L. B. Butterfield, 2935 Main St., **$147,901.** Awarded 2/8. Alden K. Fogg, city engr.

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North Carolina—State Hy. & Pub. Wks Comn., Raleigh, Feb. 22, structures 1.6 mi. U. S. 74, from point on U. S. 74 approx. 0.5 mi. west of Mooresboro, east through Mooresboro to east

end of Bridge over Sandy Run Creek, Proj. 8243, Cleveland Co., from Harvey H. Stewart, Box 1392, Charlotte, Zone 4, $83,713 est $75,000-$100,000***structures 2.5 mi. between Granite Falls and Grace Chapel, Betterment Sect. 8-7-69-15, Caldwell Co., from Columbus Contractors Whiteville, $57,500 est. $50,000-$75,000***bridge on county road 0.5 mi. south of Farrington, Chatham Co., from Claude C. Wheeler, 602 Raleigh St., Oxford, $60,618 est. $50,000-$75,000. CD 2/11—ENR 2/17.

Tex., Dallas—City, Earl Goforth, secy., Feb. 19, rein.-con. underpass on St. George St., from Austin Road Co., & Austin Bridge Co., 1000 Singleton Blvd., $334,515. Est. $200,000. CD 2/2—ENR 2/10.

CONTRACTS AWARDED

California—State Div. Hys., 808 State Bldg., Los Angeles, rein.-con. box girder undercrossing on Hollywood Parkway at Heliotrope Dr., Los Angeles Co., to Charles MacCloskey Co., 112 Market St., San Francisco, $506,752. Bids 2/10. CD 2/15—ENR 2/17, under LB.

Idaho — State Hy. Dpt., Boise, 1,352 ft. bridge, over Clearwater River, Nez Perce Co., to Henry Hagman, Cashmere, Wash., and Erickson Paving Co., 1550 N. 34 St., Seattle, Wash., $529,192. Est. $568,140. Bids 1/28. CD 2/8—ENR 2/10, under LB.

Oregon—State Hy. Dpt., Salem, Sauvies Island Bridge, FAP S-54(1), Multnomah Co., to Gilpin Constr. Co., 4850 N. W. Front St., Portland, $809,411. Bids 1/24, awarded 2/18. CD 2/7—ENR 2/10, under LB.

STREETS AND ROADS

BIDS ASKED

March 7

N. Y., New York—President Manhattan Boro, Municipal Bldg., Zone 7, laying, relaying sidewalks, setting and resetting curbs. Contr. 463.

March 8

Ia., Bloomfield—City, City Hall, paving, $65,000. Brown Eng. Co., 322 K P Bldg., Des Moines, engr.

Mich., Detroit—Dpt. P. Wks., City Hall, grading, draining, paving, concrete curb, 371 ft. Driggs St., Alley E. Campbell to Junction St. P. W. 610, 1,336 ft. Longacre St., 154 N. Joy to Pitzpatrick Sts., P. W. 628, 258 ft. Arnold St., Lonyo to St. Lawrence Sts., P. W. 636, 1,398 ft. Gilchrist St., Curtis to Margareta Sts., P. W. 642, 757 ft. St. Lawrence St., Baubee to Arnold Sts., P. W. 647, 824 ft. Wisconsin St., Pembroke to Chippewa Sts., P. W. 653, 766 ft. Dolphin St., Outer Dr. to Schoolcraft St., P. W. 655, 968 ft. Lyndon (a) St., Ardmore to Schaefer Sts., P. W. 660, 968 ft. Lyndon (b) St. Ardmore to Schaefer St., P. W. 661, 802 ft. Fenrod St., Plymouth to Wadsworth Sts., P. W. 663, 1,581 ft. Plainview St. Plymouth to Capitol Sts., P. W. 664, all foregoing Group 49-1; 1.097 ft. Balfour St. 478's Moross to Moross Sts., P. W. 623, 1,363 ft. Liberal St., Crusade to Redmond Sts., P. W. 626, 813 ft. Caldwell St., Lantz to Outer Dr., P. W. 639, 181 ft. Cornwall St., Radnor to 112 ft. E. Radnor Sts., P. W. 640, 572 ft. Seymour (a) St., Queen to Hayes Sts., P. W. 649, 572 ft. Seymour (b) St., Queen to Hayes Sts., P. W. 650, 462 ft. Manning St., Crusade to Rex Sts., P. W. 662, 557 ft. Sanilac St., 527's Moross to Moross Sts., P. W. 669, 790 ft. Annott St., Pinewood to Manning Sts., P. W. 712, 1,297 ft. Barlow St., Bringard to 8 Mile Rd., P. W. 713, 1,134 ft. Beaconsfield St. 320' N. Casino to Moross Sts., P. W. 714, 911 ft. Bloom St., Emery to Lantz Sts., P. W. 715. CD 3/30—ENR 4/1/43.

Que., Montreal South—Y. Saurette, 119 S. Victoria Ave., paving several streets, for Municipality. Plans deposit $15. CD 2/23—ENR 3/17.

March 9

La., Franklin—St. Mary Parish Police Jury, Franklin, cement sidewalk, Hy. 90 from Roland Barrilleaux's to Calvary Church.

March 15

†Virginia—Pub. Roads Admin., 1440 Columbia Pike, Arlington, 34.266 mi. Blue Ridge Parkway, Floyd, Patrick and Carroll Counties. Plans deposit $10.

March 22

Tenn., Chattanooga—City, c/o City Engr., resurfacing 10.17 mi. streets, $250,000. Extended date. CD 1/17—ENR 1/20.

LOW BIDDERS

†California—Pub. Rds. Admin., 720 Phelan Bldg., San Francisco, 1.008 mi. by Mosquito Ridge Tahoe National Forest, FH-06-D(7) from N. M. Ball Sonic, Box 430, Berkeley, $52,481.

Calif., Los Angeles—City Bd. P. Wks., 153 City Hall, Feb. 16, grading, paving, Hoover St., 9 St. to Olympic Blvd., from McClain Constr. Co., 470 N. Prairie St., Hawthorne $64,260. Est. over $70,000.

Colorado—State Hy. Dpt., Denver, Feb. 17, grav. 2.288 mi. State Hy. 6, Colo. Proj. F 001-3 (6), Fremont and Pueblo Counties, from Brown Constr. Co., 1539 East Abriendo St., Pueblo, $247,077. Est $253,744.

Idaho—State Hy. Dpt., Boise, crushed rock surf. 10.718 mi. Moscow-Bovill Hy., Latah Co., from J. A. Bryant, Lewiston, $54,000. Est. $53,630.

Massachusetts — Commonwealth of Mass. Dpt. P. Wks., 100 Nashua St., Boston, Feb. 15, Buzzards Bay By-Pass, Bourne, from Central Constr. Co., 6 Beacon Ave., Lawrence, $206,909***Apremont Hy., Holyoke, from Cook-Ross Inc., 50 Lorenzo St., Torrington, Conn., $69,910. CD 2/9.

†New Mexico—Pub. Roads Admin., 234 New Custom House, Denver, Colo., Feb. 16, 0.102 mi. gunite, tunnel lining, pavement and portal constr., Alamogordo-Cloudcroft, New Mexico Forest Proj. 35-D-1, Otero Co., from Harry Thygeson & Co., Albuquerque, $121,976. Est. over $50,000.

North Carolina—State Hy. & P. Wks. Comn., Raleigh, Feb. 22, traffic bound macad. and bit. 2.78 mi. relocation county road in vicinity of Lenoir running parallel with Spainhour Creek and relocating U. S. 321 in Lenoir, Betterment Sects. 8-7-69-14, 8-6-69-143, Caldwell Co., from E. H. Hines Constr. Co., Box 924, Greenwood, S. C., $98,115 est. $125,000-$150,000***STBC bit. 2.5 mi. between Granite Falls and Grace Chapel, Betterment Sect. 8-7-69-15, Caldwell Co., from Suber & Co. Inc., Box B, Whitmire, S. C. $59,087 est $50,000-$75,000***traffic bound macad., sand asph. etc. 6.44 mi., Rts. N. C. 97 and 305, from point southeast of north city limits of Windsor, north toward Aulander, Proj. 1076, Bertie Co., from Nello L. Teer Co., Box 1131, Durham, $138,969 est. $150,000-$175,000***grading 9.38 mi. U. S. 64, east of Plymouth, east through Westover to Skewarkey on U. S. 64 at Pleasant Grove, Proj. 2-651, Washington Co., from J. S. Hill Constr. Co., Washington, $104,120 est. $125,000-$150,000***traffic bound macad. (wid'n) and b. conc. 11.64 mi. U. S. 1 and 64 from junction U. S. 1 and 64, northeast to Cary, U. S. 64 from Chatham Co. line east to junction U. S. 64 and 1, Wake Co., from F. D. Cline Constr. Co., Box 249, Raleigh, $138,823 est. $150,000-$175,000*** traffic bound macad., bit. 1.78 mi. U. S. 21, from point south of south end of Third Creek Bridge approx. 3 mi. south of Statesville city limits, north to point approx. 1.2 mi. south of Statesville, $387,000 Caldwell Co. from Gilbert Eng. Co., Statesville, $66,306 est. $75,000-$100,000***traffic bound macad., bit. 6.39 mi. N. C. 27 from point on U. S. 29 and 74 approx. 6 mi. west of Charlotte, north to N. C. 27, and N. C. 27 from Tuckaseegee Dr. near west city limits of Charlotte to ints. with Old N. C. 27 at Thrift, Mecklenburg Co., from Blythe Bros. Co., 424 S. Brevard St., Charlotte, $85,729 est. $75,000-$100,000***traffic bound macad., bit. 4.83 mi. from end of bit near Prison Camp northwest to N. C. 89 at Bottom, Surry Co., from National Truck Service, Inc., Box 39, Asheville, $98,284 est. $125,000-$150,000. CD 2/11—ENR 2/17.

South Carolina—State Hy. Dpt., Columbia, Feb. 16, widening 2.2 mi. S. Main St. in Greenwood, Proj. U-55(7), from C. Y. Thomason Co. & E. H. Hines Constr. Greenwood, $308,139. CD 2/11.

Tex., Beaumont—Jefferson Co., Courthouse, Feb. 14, road imprv., all-weather surfacing, Lawhon, Boyt, Pecan, Farm-Brook Rds., from Farnsworth & Chambers, Inc., Beaumont, $99,612. CD 1/31—ENR 2/3.

CONTRACTS AWARDED

Calif., Santa Monica—City Council, City Hall, curbs, gutters, sidewalks and storm drain facilities, San Vicente Blvd., to L. C. Nappe, 1201 N. Keystone St., Burbank, $127,-738. Bids 1/11, awarded 2/8. CD 11/15/44 —ENR 11/30/44.

Oregon—State Hy. Dpt., Salem, grading, paving 5.74 mi., constr. 4 concrete bridges, 7 concrete box culverts on Tillamook-Pleasant Valley sect., Oregon Coast Hy., FAP F-137, Tillamook Co., from Edwin C. Gerber, Oregon City, $792,215. Bids 1/24, awarded 2/18. CD 2/7—ENR 2/17, under LB.

Oregon—State Hy. Dpt., Salem, 0.89 mi. grading, paving 0.89 mi., constr. concrete, steel railroad highway separation structure, concrete siphon on Sundial Sect. of Columbia River Hy., FAP FI-301 (5) and FGI 301 (6), Multnomah Co., to Carl M. Halvorson, Builders Exchange Bldg., Portland, $526,132. Bids 1/25, awarded 2/18. CD 2/7—ENR 2/10, under LB.

Tex., Baytown—W. L. Jones & Son, c/o Greens Bayou, Houston, grading, drainage, paving, streets, own forces, $490,000. CD 1/3—ENR 5/20.

Tex., Beaumont—Jefferson Co., c/o H. A. May, comr. Precinct 2, Courthouse, asphalt paving in Precinct 2, incl. 2.47 mi. Crosby-Huffman Rd., 2.63 mi. Wolf Rd., 2.12 mi. Atascocito Rd. and paving certain other road portions, force account, $90,000. Charles L. Davidson, co. engr.

Tex., Houston—W. E. Sampson & E. Phil Gimmer, 2905 Milam St., street paving in Riversidecrest, Sects. 1 and 2, own forces, $65,000.

Tex., Karnes City—Karnes Co., W. S. Pickett, judge, farm-to-market road constr., partial route beginning at Karnes City-Arnold School, $80,000; between Hobson and Arnold Schools, $75,000, force account. C. C. Klumpp, Kenedy, engr.

Tex., Liberty—Liberty Co., R. E. Pitts, judge, Courthouse, farm-to-market road constr., imprvs., own forces, $79,000. CD 12/30/47 —ENR 1/22/47.

Tex., Olton—Lamb Co., Judge, Courthouse, Olton, road imprvs., Precincts 1, $60,000; Precincts 2, $70,000, force account. Garrett Eng. Co., 1806 Milam St., Houston, engr.

Tex., San Antonio—E. J. Burke & Sons, 4220 S. Zarzamora St., asphl. streets adjacent to Highland Hills, force account, $90,000.

●Washington—State Hy. Dpt., Olympia, reconstructing, repaving 0.819 mi. Primary St. Hy. 8, in Vancouver shipyard vicinity, E.P.P. No. ER-15 (1), Unit 1, Clark Co., to Guy F. Atkinson Co., 10 W. Orange Ave., South San Francisco, Calif., $1,084,358. Bids 2/18. CD 2/3—ENR 2/10.

Washington—State Hy. Dpt., Olympia, lowering grade and paving 0.978 mi. Primary State Hy. 3, in Spokane, Sprague Ave. and Division St., F.A.P. FG 041-1 (1), Spokane Co., to C. A. Power, E. 915 Marietta St., Spokane, $75,608. Bids 2/18. CD 2/3—ENR 2/10.

EARTHWORK, WATERWAYS

BIDS ASKED

March 8

●Pennsylvania—Dpt. Forests & Waters, 404 Education Bldg., Harrisburg, 4 silt impounding basins on Schuylkill River, Seyfert No. 1; Seyfert No. 2; Oaks and North Abrams, $1,200,000. Plans deposit $5 each. Schuylkill River Proj. Engineers, 20 S. 15 St., Phila., engrs.

●Ontario and Quebec—Hydro-Electric Power Comn. of Ontario, 620 University Ave., Toronto, Ont., excav., disposal of material, La Cave power development, easterly shore Ottawa River, River Rouge, Twp. Bolsclerc, Temiscamingue Co., Que., 5 mi. upstream from Mattawa, Ont. Approx. $3,500,000. Plans deposit $25.

March 10

Va., Virginia Beach—Town c/o Town Mgr., reconstructing seawall and walkway. Plans deposit $10. CD 2/23.

March 11

†North Dakota—U. S. Eng., Fort Lincoln, Box 300, Bismarck, penstock gates for Garrison Dam, Eng-32-015-49-68. CD 6/1/44"— ENR 6/15/44.

March 15

La., Bossier City—Bossier Levee Bd., Bossier City, enlarging drainage channels, Bossier Parish. CD 11/8—ENR 11/11.

†Oklahoma—U. S. Eng., Box 61, Tulsa, 3,600 acres clearing for Hulah Reservoir, $60,000. CD 8/31/44—ENR 9/21/44.

†Washington—U. S. Eng., 19 E. Poplar St., Walla Walla, design, fabrication, del. 1 metal-enclosed power center and 2 metal-enclosed weather-proof control stands for McNary Dam, Serial No. Eng. 45-164-49-32. Wm. Whipple, dist. engr.

March 17

†New York and New Jersey—U. S. Eng., 102 Wall St., New York, Zone 5, N. Y., removal material, incl. ledge rock in Sect. 5, Rock Area 11, New York and New Jersey Channels.

March 29

●†Pennsylvania—Dpt. Forests & Waters, 404 Education Bldg., Harrisburg, dredging, floodway clearing and excav. River Sect. 4, of Schuylkill River desilting proj., Chester Co., $2,500,000; dredging floodway clearing and excav. river Sect. 2 of the Schuylkill River desilting proj., Berks Co., $2,500,000. Plans deposit $50 each. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.; adv. ENR 2/3.

March 30

●Pennsylvania—Dpt. Forests & Waters, 404 Education Bldg., Harrisburg, constructing Auburn Desilting Basin 1, right, on Schuylkill River between Auburn and Landingville, Schuylkill Co. $2,500,00. Plans deposit $25. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.; adv. ENR 2/3.

LOW BIDDERS

†Arkansas—U. S. Eng., F. Bldg. 321-23 St., Wash., 35, D. C. Feb. 8, levee work, St. Francis Basin Proj., Mud Slough Drainage Dist., Green Co., Serial No. Eng. 40-041-49-92, from Pioneer Constr. Co., Inc., Dyersburg, Tenn., $264,851. Est. $258,819. CD 1/28—ENR 2/3.

†Colorado—Bureau Reclamation, Dpt. Interior Bldg 1-A, Denver Federal Center, Denver, Feb. 8, one 1,500 kva. substation at Fleming Colorado-Big Thompson Proj., Spec. 2055, from E. A. Koeneman Electric Co., 1408 Delmar Blvd., St. Louis, Mo., $49,889. CD 1/25—ENR 1/27.

†Oregon—U. S. Eng., Pittock Block, Portland, Feb. 15, restoring revetment along Bradford Island, downstream, from spillway dam at Bonneville, Serial No. Eng.-026-49-399, from Miller & Strong, 3871 Royal Rd., Eugene, $74,915. Est. $66,481. CD 2/3.

†Pennsylvania—U. S. Eng., P. O. Box 1715, Baltimore 3, Md., Feb. 16, constructing closures, Units 1 and 2, Williamsport, Unit 1, from The Empire Constr. Co., 28 S. Calvert St., Baltimore 2, Md., $33,027, est. $27,351***Unit 3, from Elmhurst Contg. Co., Inc., 53-09, 97 Pl., Corona, N. Y., $497,020, est. $523,311***Combined Units 1 and 3 from Buck & Donohue, Inc., 730 Broad St., Newark 2, N. J., $480,001, est. $545,875. CD 1/18—ENR 1/20.

†Washington—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., Feb. 17, 26 stop logs, Spec. 2546, Columbia Basin Proj., Grand Coulee Dam, from Johnson Machine Works, Inc., Chariton, Ia., $97,854. CD 1/24—ENR 2/3.

†Washington—U. S. Eng., Pittock Block, Portland, Ore., cancelled bids to have been opened Feb 25, levee imprv., in Wahkiakum Diking Imprvt. Dist. 4, along levee on south

(Continued on page 104)

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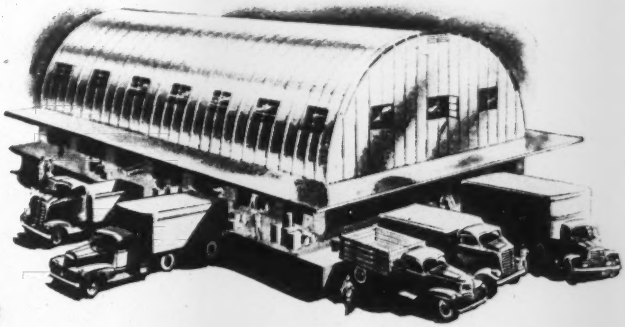

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(Continued from page 102)

side of dist. 4 mi. southeast of Skamokawa. Serial No. Eng., 35-026-49-418. Will readvertise. CD 2/17.

CONTRACTS AWARDED

Minn., Gaylord—Sibley Co., W. C. Odenberg, and Gaylord, repairing, imprv. County Ditch 13A and laterals, to V. H. Carroll, Atlantic, Ia., $69,231. Bids 2/1. CD 1/4—ENR 1/20

Pennsylvania—Dpt. Forests & Waters, 463 S. Office Bldg., Harrisburg, flood control and recreation dam on Little Pine Creek, 25 mi. north of Williamsport, Lycoming Co., to Lycoming Constr. Co., 127 Susquehanna St., Williamsport, $2,030,800. Est. $2,500,000. Bids 2/10 awarded 2/17. CD 2/14—ENR 2/17, under LB.

Tex., Fulton—Aransas County Navigation Dist., Rockport, water front imprvs. to Beass Bros., Victoria, $15,000. James A. Jarboe, Rockport, engr.

AIRPORTS AND AIRBASES

BIDS ASKED

March 8

Neb., Omaha—AIRPORT IMPRVS.—City, M. J. Dineen, clk., Municipal airport imprvs. incl. runway lighting, fencing, $80,000. Kirkham Eng. Co., 1504 Dodge St., engrs. CD 1/40/45—ENR 2/1/45.

N. Y., Albany—AIRPORT PAVING—Bd. Contr. & Supply, City Hall, airport paving imprvs. Parsons, Benckenhoff, Hogan & McDonald, 75 Fulton St., New York, engrs. CD 5/23/45—ENR 6/13/46.

March 9

Ill., Chicago—AIRPORT—City, Dpt. Purchases, Contrs. & Supplies, City Hall, utilities, paving, mtnl. conn. to junction, contr. 1 excav., drainage, water distr. sys., sewage, concrete paving, etc. Chicago Orchard (Douglas) Airport, near here. Plans deposit $100. CD 11/4/45—ENR 11/29/45.

S. D., Aberdeen—AIRPORT BLDG.—City, airport administration bldg., $118,000. Glynne, Shiffler, Barkstrom & Assoc., 17 W. Franklin Ave., Minneapolis, Minn., archts. CD 1/6—ENR 1/20.

March 10

Ky., Hazard—AIRPORT IMPRVS.—Hazard Air Bd., Hazard, grading, draining, seeding, marking airport, $124,000. CD 12/27/44—ENR 1/11/45.

March 16

N. Y., Buffalo—AIRPORT IMPRVS.—Dpt. P. Wks., City Hall, grading, paving, drainage at airport, $800,000. CD 6/29—ENR 8/2.

LOW BIDDERS

Ala., Birmingham—AIRPORT LIGHTING SYSTEM—City, engr. J. D. Webb, city engr., Feb. 16, high intensity runway lighting sys. at Municipal Airport, from J. R. Hines, West Palm Beach, $103,225. CD 1/25—ENR 1/27.

LATIN AMERICA

Argentina, Buenos Aires—Republic of Argentina, Buenos Aires, receiving bids March 15, constructing, installing travelling crane sys. and new dredge.

Brazil, Rio de Janeiro—Republic of Brazil, Rio de Janeiro, reconstructing docks, 400 meters long and 80 meters wide, to Christiani & Neilson, Rio de Janeiro, $7,000,000 Cruzeiros. Ministry of Wks., Rio de Janeiro, engr.

Ecuador—Esso Standard Oil Co., Ltd., Quito, petroleum field in Oriente region to be exploited, own forces, $500,000.

PUBLIC BUILDINGS

BIDS ASKED

March 7

†N. J., Hammonton—U. S. Eng., Armory Dr., Trenton, motor storage bldg., $70,000.

March 8

Conn., Manchester—Town, Bd. Educ., Manchester, 1 story, brick, steel, concrete 12 room school, Woodbridge Dist., Princeton St., $325,000. Carl J. Mahnfeldt & Assoc., 36 Pearl St., Hartford archts. and Paul D. Bemis, 36 Pearl St., Hartford, engr. CD 3/3—ENR 3/8.

Ia., Mason City—Bd. Educ., Mason City, Harding School addn., $385,000. CD 12/1—ENR 1/6.

N. Y., Utica—Bd. Educ., 13 Elizabeth St., school addn., $500,000. Frank C. Dellecesse, First National Bank Bldg., archt.

Wis., West Allis—Housing Auth. of West Allis, 7525 W. Greenfield Ave., Zone 14, 13 two story, bsmt., 30x116 ft., brick, frame apartments, block 5dgs. $842,000. Plans deposit $10. Gieske & Schramek, 6501 W. State St., Milwaukee, Zone 3, archt. P. H. Burbach, city engr. CD 2/11.

†Fla., Gainesville—Officer in Charge of Construction, Charleston Naval Shipyard Naval Base, S. C., 12 @ 140 ft., concrete masonry Naval Reserve Training Center, Spec. 21489. Extended date. CD 2/16—ENR 2/24.

Mo., Fulton—Wm. L. Smith, state purch. agt., 105 State Capitol, Jefferson City, 1 and 2 story, 44x75 ft. and 44x72 ft., brick, stone, concrete Greene D. McCall Infirmary, Missouri School for the Deaf. Plans deposit $25. Jamieson & Spearl, 1626 Arcade Bldg., 812 Olive St., St. Louis Zone 1, archts.

March 10

Fla., Highland City—Polk Co. Bd. Pub. Instruction, Bartow, school. Donovan Dean & Assoc., 905 E. Main St., Lakeland, archts.

†**Fla., Tampa**—Construction Officer, Charleston Naval Shipyard, Naval Base, S. C., Naval Reserve Training Center, alterations, imprvs. and addnl. facilities, Spec. 21392. Plans deposit $15.

La., Ville Platte and Vidrine—Barron & Heinberg, archts., 512 Guaranty Bank, Alexandria, steel, brick gymnasium and classrooms, at Vidrine school and steel stadium at Ville Platte School, for Evangeline Parish School Bd., Ville Platte. Plans deposit $15.

†**Md., Camp Detrick**—U. S. Eng., First and Douglas Sts. N. W., Wash., 25, D. C., 2 story row house. Serial No. Eng. 49-080-49-76 (20)M. CD 8/5—ENR 8/29.

†**Mich., Battle Creek** — U. S. Eng., 520 Merchandise Mart, Chicago, Zone 54, Ill., addnl. post exchange facilities, for Percy Jones General Hospital, Serial No. Eng. 11-032-49-69. Extended date. CD 1/18—ENR 1/20.

Miss., Rulesville — Bd. Supervs. Sunflower Co., Indianola, hospital. Plans deposit $50. Dent & Aydelott, First National Bank Bldg., Memphis, Tenn., archts. CD 1/20—ENR 2/3, under L.B.

●**N. Y., Mt. Vernon**—Municipal Housing Auth., 22 W. First St., housing. $6,200,000. Fellheimer, Wagner & Vollmer, 155 E. 42 St., New York, Zone 17, archts. CD 11/3—ENR 11/25.

●**N. Y., Troy**—Bd. Contr. & Supply, City Hall, superstructure for high school. $4,000,000. Plans deposit $150. Extended date. Frank J. Morgan, 253 Broadway, archt. CD 1/20—ENR 1/27.

N. C., Lewisburg—Franklin County Memorial Hospital, Lewisburg, 3 story, no bsmnt., approx. 30,000 sq. ft. irregular shape, general hospital. $400,000. Plans deposit $40. Frank W. Benton, Wilson, archt.

O., Bowling Green—George B. Sowers, Dir. Pub. Wks., 705 Ohio Dpts. Bldg., Columbus, Men's Dormitory 8, Bowling Green State University. H. G. Allen, Div. State Architect & Engr., Columbus, consult. archt.

S. C., Varnville—Hampton Co., hospital, $250,000. Lafaye, Lafaye & Fair, 1226 Sumter St., Columbia, archts.

Tenn., Cookeville—City, hospital. $450,000. Charles H. McCauley, Jackson Bldg., Birmingham, Ala., archt. CD 12/22/47—ENR 1/8/48.

Va., Charlottesville—At office of Colgate W. Darden, Jr., pres. University of Virginia, Charlottesville, law bldg., addns. at University of Virginia. $300,000. Taylor & Fisher, 1012 N. Calvert St., Baltimore, Md., archts.

March 11

Ala., Mobile—Mobile Co., Mobile, Vigor High School addns., alterations. $440,000. Edward D. Slater, O'Gwynn Bldg., archt.

†**Tenn., Nashville**—Public Bldgs. Admin., Federal Office Bldg., U. S. Court House, elevator plant in federal office bldg., Broadway, Eighth Ave. S., McGavock St. and Ninth Ave. S.

March 14

Wash., Almira—School Dist. 17, Almira, school and gymnasium. $250,000. Plans deposit $25. W. H. Rothe, Liberty Bldg., Yakima, archt. CD 2/4.

March 15

Calif., San Leandro—San Leandro Bd. Educ., Hepburn and Clark Sts., concrete, frame, brick veneer Grover Cleveland School. Over $250,000. Plans deposit $20, Dragon, Schmidts & Hardman, 1320 University Ave., Berkeley, archts.

Calif., Ukiah—Mendocino Co., Courthouse, 4 story, rein.-con. Jailhouse and courthouse. Over $250,000. Plans deposit $25. Clarence Caulkins, Rosenberg Bldg., Santa Rosa, archt. Jefferson C. Sly, 580 Market St., San Francisco, engr. CD 1/18—ENR 1/20.

N. Y., Long Island City—New York Housing Auth., 63 Park Row, New York, Zone 7, foundations, appurtenances for Ravenswood Houses, Sect. 1, Proj. NYC-20, consisting 17 bldgs. in area bounded 21 St., 34 Ave., 24 St. and 36 Ave. Plans deposit $75. CD 9/8/47—ENR 9/18/47.

N. Y., New York — New York City Housing Auth., 63 Park Row, Zone 7, street and yard imprvs. for Lillian Wald Houses, Proj. No. NYS-2, in area bounded by Avenue D, East River Dr., E. 6 St. and E. Houston St. Plans deposit $25.

●**N. Y., Troy**—Housing Auth., City Hall, housing, $4,000,000. Extended date. J. F. Lankton & John W. Ziegle Assoc., 110 Main St., Peoria, Ill., and Reisner & Urbahn, 660 Madison Ave., New York, archts. CD 2/9—ENR 2/17.

Tex., Austin—City, Gulton Morgan, mgr., City Utilities Offices, electric power plant imprvs, $85,000. Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., engrs. CD 2/9/48—ENR 2/26/48.

†**Tex., Camp Hood**—U. S. Eng., 606 Santa Fe Bldg., Galveston, relocation, remodeling, rehabilitating apartments, Inv. No. Eng-41-243-49-227. $250,000. Tentative date.

March 16

N. Y., Flushing—Bd. Higher Educ., Administration Bldg. of Queens College, 65-30 Kissena Blvd., Flushing, general contract, plumbing and drainage, heating, ventilating and air-conditioning, electrical work, elevator and dumbwaiter, lighting fixtures and illuminated signs for various work in connection with Science Bldg. I for Queens College. CD 10/15—ENR 11/11.

●**Que., Sherbrooke** — McDougall & Assoc., archts., 1235 McGill College Ave., Montreal, 3 story, bsmnt., 46 x 226 ft. and 50 x 160 ft., rein.-con. steel, brick hospital, Portland Ave.,

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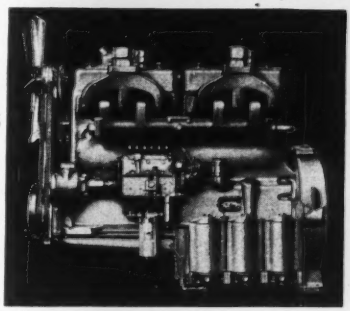

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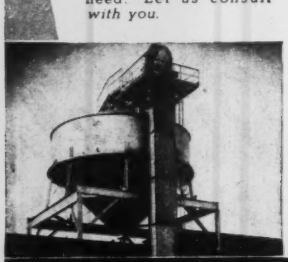

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Pittsburgh, Pa. 3414 Neville Island
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for Bd. Governors, Sherbrooke, $1,500,000. McDougall & Friedman, 1235 McGill College Ave., Montreal, engrs. CD 12/16/46—ENR 12/26/46.

March 17

†Tex., Fort Bliss (El Paso P. O.)—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., moving, relocating mess hall, Bldg. T-4065 (Ft. Bliss RUG-9) Serial No. Eng. 20-005-49-47. $250,000. Extended date. CD 2/9—ENR 2/17.

March 23

O., Kent—Dir. P. Wks., Div. State Architect & Engineer, 705 Ohio Dpt. Bldg., Columbus, men's physical education bldg., Kent State University. $673,000. Plans deposit $25. Harry A. Fulton, 6014 Euclid Ave., Cleveland, Zone 3, archt. H. G. Allen, 705 Ohio Dtps. Bldg., Columbus, consult. engr. CD 12/9—ENR 12/8.

●**Pa., Danville**—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, general contract; heating and ventilating; plumbing and drainage; electrical work; elevators. Admission Bldg. 1 at Danville State Hospital, $1,700,000. Plans deposit $15 for general, $7.50 each for others. von Storch & Pearce, 506 Spruce St., Scranton, archts. A. F. Jones, c/o owner, ch. engr. CD 2/19/48—ENR 3/4/48.

Pa., Woodville — Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, general contract; heating and ventilating, plumbing and drainage, electrical work, two freight elevators for dietary bldg. at Woodville State Hospital. $940,000. Plans deposit $15 for general, $7.50 for others. Ingham, Boyd & Pratt, Empire Bldg., Pittsburgh, Zone 22, archts. A. F. Jones, c/o owner, ch. engr. CD 8/25/47—ENR 9/4/47.

March 24

†Alaska, Big Delta—U. S. Eng., (APO 942, c/o P. M., Seattle, Wash.), Anchorage, one family dwelling for Alaska Communication Sys. Inv. S95-507-49-19. Plans deposit $50.

†Alaska, Fort Randall—U. S. Eng., (APO 942, c/o P. M., Seattle, Wash.) Anchorage, one family dwelling for Alaska Communication Sys., Inv. S95-507-49-20. Plans deposit $50.

†Alaska, Fort Richardson — U. S. Eng. (APO 942, c/o P. M., Seattle, Wash.) Anchorage, one 8-family quarters and two duplex family quarters for Alaska Communication Sys. Inv. S95-507-49-21. Plans deposit $50.

March 29

●**Tex., Galveston**—John Sealy Hospital Foundation c/o J. W. McCullough, pres., 915 Strand St., one 6 story and one 3 story rein.-con., masonry bldgs. $2,500,000. Extended date. C. H. Page & Son, 305 W. 1 St., Austin, archts. CD 2/8—ENR 2/10.

About April 1

N. C., Winston-Salem — City, Bd. Alderman, Winston-Salem, hospital addn. Over $500,000.

April 4

Wis., West Allis — Bd. Educ., 7510 W. National Ave., Zone 14, 4 story, humid., 152x160¾ ft. steel, concrete, brick, stone Horace Mann High School, concrete fdn., $900,000. Lindl-Schutte, 808 N. 3 St., Milwaukee, Zone 33, archts. CD 11/20/46—ENR 12/12/46.

About April 15

●**Ga., Thomaston**—Upson Co. Hospital, Thomaston, hospital, $1,000,000. Extended date. W. J. J. Chase, 140 Peachtree St., Atlanta, archt. CD 7/14—ENR 7/22.

Late in April

●**†D. C., Wash**—Pub. Bldgs. Admin., Federal Wks. Bldg., constr. new federal courts bldg., 3 St. Constitution Ave. and John Marshall Pl. and C St. N.W. $18,665,000. CD 2/23.

LOW BIDDERS

Calif., Stockton—Stockton Unified School Dist., San Joaquin and Lindsay Sts., Feb. 15, homemaking wing for Edison High School, from H. H. Henning, 1758 Berkeley Ave., **$263,500.** CD 1/25—ENR 1/27.

●**Ill., Hinsdale**—Hinsdale Bd. Educ., Hinsdale, Feb. 14, general contract 2 story, brick, steel, concrete high school, from E. H. Marhoefer Jr., 505 N. LaSalle St., Chicago, **$1,124,750.** CD 2/8—ENR 2/10.

Ill., Springfield—City, City Hall, 2 outdoor electric substations, from Maloney Electric Co., 5390 Bircher Ave., St. Louis, Mo., **$81,870.** Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., engr. Awarded 2/22. CD 8/22—ENR 9/6/45.

Ill., Urbana—Illinois National Guard, Urbana, motor storage bldg., from Mayfair Constr. Co., 5660 N. Kedzie St., Chicago, **$114,800.**

Ind., Connersville—Bd. School Trustees, Connersville, Feb. 18, general contract school, from F. N. Runzendahl Co., Connersville, **$253,467.** CD 2/2—ENR 2/10.

Mass., Boston — City of Boston Housing Auth., 10 Post Office Sq., Feb. 16, 43 unit veterans housing, Columbia Rd. and P St., South Boston, from Jefferson Constr. Co., 75 1 St., Cambridge, **$506,181.**

●**Mass., Lexington**—Town, Supt. Schools, High School Bldg., 1475 Massachusetts Ave., Feb. 16, Senior High School, Waltham St., from Vara Constr. Co., Inc., 718 Huntington Ave., Boston, **$1,235,595.** CD 1/31—ENR 2/3.

Minn., Bemidji—State Dpt. Admin., P. T. Peterson, dir. Purchases, 19 State Capitol, St. Paul, Feb. 15, general contract laboratory bldg., State Teachers College, from H. L. Stavn, Inc., Hibbing, **$444,000.** CD 1/3—ENR 1/6.

Mo., Marshall—State Dpt. P. Health & Welfare, Sam Marsh, dir., State Office Bldg., Jefferson City, and John F. Powell, dir. P. Bldgs., State Capitol, Jefferson City, rejected bids Jan. 27, 1 and 2 story, 55x66 ft. and 36x177 ft. and 30x55 ft., brick, concrete tubercular patients bldg., L. B. **$303,469.** Will re-advertise. CD 2/8—ENR 2/10, under LB.

●**N. Y., Brooklyn**—New York City Housing Auth., 63 Park Row, New York, Zone 17, general contract, Glenwood Houses, Proj. No. NYC-12, in area bounded by Farragut Rd., E. 56 St., Avenue H, Glenwood Rd. and Ralph Ave., from George F. Driscoll Co., 41 E. 42 St., New York, Zone 17, **$6,867,686*****plumbing, from Lipsky & Rosenthal, Inc., Lexington Ave. and 115 St., New York Zone 29, **$924,000*****heating and ventilating, from Heating Maintenance Corp., 220 E. 138 St. New York, Zone 5, **$898,600*****electrical work, from John G. Hellman, 391 Fulton St., Zone 1, **$346,170.** CD 2/14—ENR 2/17.

●**N. Y., White Plains**—Housing Authority, 11 William St., Feb. 16, 450 unit housing, Brookfield St. and Fisher Ave. from Lasker Goldman Corp., 161 Remsen St., Brooklyn, N. Y., **$1,843,200.** CD 1/13—ENR 1/27.

N. C., Clinton—Bd. Comrs. Sampson Co., Clinton, Feb. 18, 100 bed hospital, from Rogers Constr. Co., Smithfield, **$627,500.** CD 1/25—ENR 1/27.

†Tenn., Oak Ridge—U. S. Atomic Energy Comn., P. O. Box 365, attention, community constr. contract sect., Oak Ridge, Feb. 16, 7 dormitories, cafeteria and bathhouse, etc., Inv. No. 401-409-8A, from John A. Johnson & Sons, Inc., 270 41 St., Brooklyn, N. Y., **$517,000.** CD 1/14—ENR 1/27.

●**Tex., Houston**—Houston Independent School Dist., 1600 Washington St., Feb. 17, 1, 2 and 3 story, 138,000 sq. ft. floor space, steel, frame, rein.-con., brick, hollow tile, Wheatley (Negro) High School near Finnegan Park, incl. swimming pool, from Farnsworth & Chambers, P. O. Box 74, **$1,820,722.**

●**Wash., Seattle** — School Bd., 810 Dexter Ave., Feb. 16, Junior High School, from J. G. Watts Constr. Co., 2315 Western Ave., **$1,545,000;** mechanical work from University Plumbing & Heating Co., 3939 University Way, **$395,000.** CD 2/2.

B. C., Vancouver—Vancouver School Bd., 590 Hamilton St., Feb. 7, John Oliver High School addn., from Smith Bros. & Wilson Ltd., 1267 Richardr St., **$965,735.** CD 1/20—ENR 1/27.

CONTRACTS AWARDED

●**Calif., San Bernardino** — San Bernardino Valley College, San Bernardino, part 1, 2 and 3 story, 75,000 sq. ft., rein.-con. school, to R. J. Daum Constr. Co., 6803 West Blvd., Inglewood, **$1,244,496.** Jess J. Jones & W. L. Culver, 501 Termino Ave., archts. Bids 1/19, awarded 2/11.

●**Calif., San Jose**—San Jose Unified School Dist., San Jose, 408 Alamaden Ave., Willow Glen Junior and Senior High Schools, to Williams & Burroughs, Inc., 10 California Dr., Burlingame, and Carl N. Swenson, Box 558 San Jose, **$1,867,000.** Bids 2/16. CD 1/25—ENR 1/27.

Calif., Tulare—Tulare City School Dist., 600 N. Cherry Ave., concrete block, frame Roosevelt School, Cherry Ave. School and Garden Ave. School addns. to Taxco Constr. Co., 420 Safford St., Fresno, **$413,500.** CD 3/18—ENR 4/1.

Ill., Naperville—School Dist. 78, 201 N. Washington St., general contract 2 and 3 story, brick, rein.-cdn. steel academic section to high school, to George Sollitt Constr. Co., 109 N. Dearborn St., Chicago. Est. **$800,000.** CD 9/18/46—ENR 10/3/46.

Mass., Framingham—Town, B. J. Merriam, supt. Schools, high school, Union Ave., to Frankini Constr. Co., 25 Mystic Ave., Medford, **$523,190.** Bids 2/8. CD 2/16—ENR 2/24, under LB.

†Nev., Boulder City—Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver Colo., 37,740 sq. ft. Junior and Senior High School, 5 classroom units and administration bldg., Spec. R3-13, to Lembke Constr. Co., 16 and Charleston Blvd., Las Vegas, Nev., **$635,324.** Bids 1/11, awarded 2/7. CD 1/21—ENR 1/27, under LB.

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, various type apartments, paving, water, sewerage and gas sys. Serial No. 291-49-15, to R. J. Daum Constr. Co., 1005 W. Colorado St., **$575,914.** Bids 2/8, under LB.

N. C., Greensboro—Women's College of University of North Carolina, Chapel Hill, general contract dormitory, to George W. Kane, Greensboro, **$844,611.** Bids 2/2. CD 2/8—ENR 2/17, under LB.

Pa., Polk—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, general contract; hospital at Polk State School, to Matthew Levo & Sons, Inc., 321 Lawrence Saving & Trust Bldg., New Castle, **$624,000.** Bids 2/2, awarded 2/23 CD 2/8—ENR 2/17, under LB.

†Tenn., Oak Ridge—U. S. Atomic Energy Comn., P. O. Box 365, Community Constr. Contract Sect., Oak Ridge, 7 dormitories, bathhouse and conversion bldg. into cafeteria, Inv. 401-49-8A, to John A. Johnson & Sons, Inc., 270 41 St., Brooklyn, N. Y., **$517,000.** Bids 2/16. CD 2/21—ENR 2/24, under LB.

Tenn., Springfield—Robertson Co., Bd. Educ., Springfield, East and West End High Schools, to Nile E. Yearwood, Stahlman Bldg., Nashville, **$501,780.** Bids 2/8. CD 2/2.

●†**Tex., Daingerfield**—Yards & Docks, Annex Navy Dpt., Arlington, Va., laboratory for guided missile, development, to Bryan, Cooper & Assoc., 420 Sul Ross, Houston, Approx. **$1,000,000.**

●**Tex., Port Arthur**—Port Arthur Independent School Dist., Port Arthur, Stephen F. Austin High School addn. and Tyrell High School addn., to Robert E. McKee, 2708 Inwood Rd., Dallas, **$784,000** est. $550,000 and **$509,000** est. $500,000 respectively. CD 1/18—ENR 1/20.

●**Va., Burkeville** — State, Richmond, 200-bed hospital structure, etc., incl. nurses home at Piedmont Sanatorium for negroes, to Virginia Eng. Co., Newport News, **$1,192,000;** plumbing and heating, to Rowe-Walsh-Jones, Durham, N. C., **$275,000.** Bids 2/3. CD 2/9—ENR 2/17, under LB.

●†**Washington**—Bureau Reclamation, Dpt. Interior Bldg. 1-A, Denver Federal Center, Denver, Colo., fabrication and installing three 108,000 generators for Units R7, R8 and R9, Grand Coulee Right Power Plant, Spec. 2375, Columbia Basin Proj., to Westinghouse Electric Corp., Gas and Electric Bldg., Denver, Colo., **$5,250,034.** Bids 9/28, awarded 2/17. CD 10/5—ENR 10/7, under LB.

●†**Washington**—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., nine 43,000 kva. transformers for Units R7, R8 and R9, Grand Coulee right power plant, Columbia Basin Proj., Spec. 2363, to General Electric Co., 450 17 St., Denver, Colo., **$906,819.** Bids 9/21, awarded 2/17. CD 9/28—ENR 10/7, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

After March 1

Pa., Huntingdon—J. C. Blair Memorial Hospital, Huntingdon, hospital addn. Over $250,000. Chatfield & Schlicher, 324 W. Chelten Ave., Phila., archts. James R. Mays, 324 W. Chelten Ave., Phila., hospital consult. archt. CD 4/24/47—ENR 5/15/47.

March 8

●**Conn., Greenwich** — Greenwich Hospital Assn., E. K. Warren, pres. Bd. Directors, 7 story, brick, steel, concrete 225 patient hospital, Perryride Rd. and Lake Ave., $3,750,000. Skidmore Owings & Merrill, 5 E. 57 St., New York, N. Y., archts. Weiskopf & Pickworth, 45 W. 45 St., New York, N. Y., structural engr. CD 2/27/47—ENR 3/11/47.

Minn., Alexandria—St. Marys Church, Rev. W. A. Renner, Alexandria, stone, brick church. $250,000. Slifer & Cone, 440 Endicott Bldg., St. Paul, archts. CD 12/15—ENR 1/6.

N. Y., Rochester—Young Women's Christian Assoc., Franklin St., Y.W.C.A. bldg. Kaebler & Wassdorp, 311 Alexander St., Rochester, archts, CD 10/25/45—ENR 11/8/45.

March 9

Conn., Bridgeport — Charles Wellington Walker, archt., 1114 State St., 2 story, bsmnt., 35,000 sq. ft. floor space, brick, steel, concrete College of Engineering, Myrtle Ave. and Park Pl., for University of Bridgeport, James H. Halsey, pres., Bridgeport, $400,000. Extended date. CD 2/15—ENR 2/17.

N. Y., Lynbrook—New York Telephone Co., 140 West St., New York, telephone bldg. addn. Voorhees, Walker, Foley & Smith, 101 Park Ave., New York, Zone 17, archts.

March 10

La., Shreveport—Dunlap Memorial Presbyterian Church, c/o Walder & Walker, archts., 1608 Slattery Bldg., church, Plans deposit $25.

After March 10

N. J., Elizabeth—C. Godfrey Poggi, archt., 621 Newark Ave., church, for Westminster Presbyterian Church, 234 Bradford Rd., $350,000. Harold E. Wagoner, 117 S. 17 St., Phila., Pa., engr. CD 7/9/47—ENR 8/7/47.

March 14

Ky., Bowling Green — First Baptist Church, c/o Lester W. Routt, archt., Vincennes, Ind., church.

About March 15

La., Crowley—Crowley American Legion Hospital, c/o Clayton J. D'Avy Jr. & Assoc., archts., Opelousas, hospital.

March 15

Ga., West Point—West Point Mfg. Co., West Point, office. Robert & Co. Assoc., 96 Poplar St. N. W., Atlanta, archts. CD 11/1—ENR 12/16.

March 16

Calif., San Francisco—Roman Catholic Archbishop of San Francisco, 1100 Franklin St., rein.-con., structural steel All Hollows Parish Parochial School. Over $250,000. Blanchard & Maher, 369 Pine St., archts. Keller & Gannon, 126 Post St., engrs.

Okla., Ada — Clerk of First Methodist Episcopal Church, Ada, church. $250,000. Plans deposit $50. L. H. Bailey, Colcord Bldg., Oklahoma City, archt.

April 7

●**Ga., Griffin**—Griffin-Spalding County Hospital Auth., Griffin, hospital. Over $1,000,000. Plans deposit $50. W. J. C. Chase, 140 Peachtree St., Atlanta, archt. CD 11/29/46—ENR 12/12/46.

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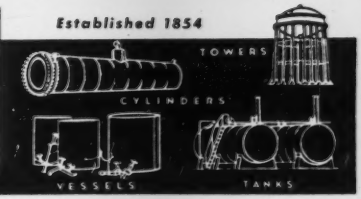

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Bids Asked

Ark., Blytheville—Bldg. Com. First Baptist Church, Blytheville, brick structure. $300,000. McAninch & Mannker, Exchange Bldg., Little Rock, archts.

Ill., Chicago—Illinois Institute of Technology, 3300 S. Federal St., 2 story, brick, steel, concrete Gas Technology Bldg. Friedman Alschuler & Sincere, 223 W. Jackson St., archts. CD 12/1/47—ENR 12/11/47.

Que., Ahunstic (Postal Dist. Montreal)—J. Crevier, archt., 5276 Notre Dame de Grace Ave., Montreal, church, Gouin Blvd., for Roman Catholic Parish of St. Nicolas. 10820 Laverdure St. $350,000. Lalonde & Valois, Canada Cement Bldg., Montreal, engrs.

SOON LETS CONTRACT

Ala., Birmingham — N. H. Waters, c/o Pembleton & Mims, archts., Title Guarantee Bldg., Birmingham, soon lets contract, 50 apartment units. Over $250,000.

Calif., Woodland — Pacific Telephone & Telegraph Co., 140 New Montgomery St., San Francisco, soon lets contract new main telephone bldg. over $250,000. Clarence Peterson & Wendell R. Spackman, 45 Second Ave., San Francisco, archts. CD 3/18/48—ENR 3/5/48.

Kan., Pittsburg — Mt. Carmel Hospital, Pittsburg, soon lets contract, hospital addn. $500,000 Maguolo-Quick, 4908 Delmar Blvd., St. Louis, Mo., archts. CD 3/24—ENR 4/8.

Ky., Louisville — St. James Evangelical & Reformed Church, c/o Walter C. Wagner & Joseph H. Potts, archts., Fincastle Bldg., soon lets contract church.

●**N. Y., Rochester**—North Park Hospital, 501 W. Main St., soon lets contract hospital, $1,500,000. Carl C. Ade, 31 Gibbs St., archt.

N. C., Charlotte—Charles W. Connelly, archt., Builders Bldg., soon lets contract country club for Myers Park Club, Inc., Myers Park. Plans deposit $25. CD 3/15/46—ENR 4/4/46.

Pa., Phila.—Simon & Boulware, archts., 123 S. Broad St., soon lets contract students dining hall for Drexel Institute of Technology, 32 and Martin Sts. $250,000. CD 12/27—ENR 1/20.

Tenn., Chattanooga—Owner, c/o Hunt, Caton & Assoc., archts. James Bldg., soon lets contract remodeling office. $250,000.

LOW BIDDERS

Minn., St. Paul—Central Lutheran School Assn., Lafond Ave. and Grotto St., refected bids Feb. 3, school, North Lexington Parkway and Englewood Ave. $350,000. CD 2/3—ENR 2/10.

Pa., Harleysville — Harleysville Automobile Mutual Insurance Co., Harleysville, insurance bldg., from George H. Evans & Co., 1914 Spring Garden St., Phila., $600,000. CD 2/11—ENR 2/17.

●**Tex., Houston**—Memorial Hospital, 602 Lamar St., project indefinitely postponed, 7 story 120-bed masonry, steel, concrete hospital addn. $1,750,000. CD 1/24—ENR 1/27.

CONTRACTS AWARDED

Ala., Fairfield—L. F. & R. L. Jeffers, c/o Hoyt Ellis, archt., Chamber of Commerce Bldg., Birmingham, 117 apartment units. Owner builds. Over $500,000.

Calif., Belmont—William Spivock, 1734 Webster St., Oakland, 24 one and two story, wood frame duplexes in Homeview Tract. Owner builds. Charles Perry, 2086 24 Ave., San Francisco, archt. $250,000.

Calif., Burbank—Cornell Theatre Corp., c/o C. J. Swale, archt., 333 S. LaCienega St., soon lets contract 1,500 seating theatre, San Fernando Blvd., near Cornell St. Over $250,000.

●**Calif., Los Angeles** — Halper Constr. Corp., 739 N. Highland Ave., 216 unit frame, stucco apartment. Owner builds. $1,000,000. Max Matzman, 4015 Jefferson Blvd., Los Angeles, archt.

●**Calif., Los Angeles**—Weber, Diller, Kalaman, 6307 Wilshire Blvd., 255 five room dwellings in Van Nuys Dist. Owner builds. $1,000,000. Southwest Drafting Serv., 2724 W. Florence St., archts.

●**Calif., Mill Valley**—De Luca Constr. Co., 90 Woodland Ave., San Rafael, 263 residences in Strawberry Manor. Owner builds. $5,000,000. Thomas & Meret, 208 De Young Bldg., San Francisco, archts.

●**Calif., Whittier and Downey**—Whiting Constr. Corp., 737 N. Highland Ave., Los Angeles, 97 dwellings, Paramount and Suva Sts., Downey; and 72 dwellings, Rechling Lane and Rosehedge St., in Whittier. Owner builds. $1,000,000.

Fla., Miami — Beth David Synagogue, c/o contractor, synagogue, to Star Constr. Co., 1636 Dupont Bldg., Miami. $790,000. CD 1/3—ENR 1/3, under LB.

Ill., Chicago—Goldblatt Bros., 333 S. State St., soon lets contract 3 story, concrete, brick, steel department store addn., 6240 S. Halsted St., Friedman Alschuler & Sincere, 223 W. Jackson St., archts. CD 12/3—ENR 12/9.

Kan., Pittsburg—Mount Carmel Hospital, c/o Sister Jane Frances, Pittsburg, 4 story, 90x125 ft. brick, concrete hospital and boiler house, to M. P. Constr. Co., P. O. Box 567, Carthage. $597,716. Bids 2/21. CD 2/23—ENR 2/24.

La., Shreveport—The National Development Co., c/o contractor, office bldg., to The Werner Co., 1320 Pierre Ave., Est. $500,000.

●**Md., Baltimore** — Albert Stark, 500 Morris Bldg., fifty-three 2 story, 32x33x60 ft., brick dwellings, 3300-34, 3301-3315-35 Clarks Lane,

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Length.....
Height.....

Name.....
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3100-18, 3101-25 Bancroft Rd., Falstaff, separate contracts. **$1,590,000.** Wm. G. Beecher, c/o owner, archt.

Mo., St. Louis—Walter F. Hellmich, Inc., 1037 Big Bend Blvd., Zone 19, 100 houses, concrete fdns., Fairview, Parker and Potomac Aves. between Brannon and Sublette Aves., own forces. **$800,000.**

N. J., Ambler — Israel Hough, Lindenwold Ave., Ambler, residential development Tennis Ave. and Race St., separate contracts, **$294,000.**

N. Y., Kew Gardens—Sam Minskoff & Sons, 521 Fifth Ave., New York, Zone 17, 2 story office and store, Queens Blvd. and 77 St. Owner builds. **$300,000.** Boak & Raad, 175 Fifth Ave., New York, Zone 10, archts.

N. Y., Poughkeepsie—Duchess Village Homes, Inc., c/o Maxwell Levinson Assoc., archts., 210 Fifth Ave., New York, 22 houses at intersection Albany Post Rd. and IBM Rd. Owner builds. **$250,000.**

S. C., Charleston — Rivercrest Apartments, Inc., 88 Broad St., 14 two story bldgs., containing 76 apartments, to Construction Service Co., 4 Court House Square, **$650,000.** William G. Lyles, Bissett, Carlisle & Wolff, Columbia, S. C., archts.

Tenn., Kingsport—Plaza Apartments, Inc., c/o Harry Sloan, Kingsport, 36 apartments. Owner builds. **$250,000.**

Tex., Bellaire — J. S. Norman Building Corp., 4815 Richmond Rd., Houston, approx. 100 dwellings in Norman Addn. of Bellaire Sect., owner builds. **$700,000.** CD 2/10.

Tex., Dallas—Moody & Tips, 701 Forest Ave. Rd., residential proj., Austin Stone and brick exteriors, constr. in Oak Cliff near Cedar Crest Country Club, own forces. **$750,000.** CD 1/14—ENR 2/3.

●**Tex., Houston**—Ayrshire Corp., 6825 Academy St., 93 dwellings in various sections of town. Owner builds. **$2,225,000.** CD 2/9—ENR 2/10.

Tex., Houston—George A. Beck & Fred T. Harrison, 2901 Rice Blvd., addnl. housing, Bellfontaine St., etc. Owner builds, **$250,000.**

Tex., Houston — R. E. Boyker, 3780 Robinhood St., housing, Braes Heights, own forces. Approx. **$500,000.** CD 2/10.

Tex., Houston — A. R. Foster, 3022 Albans St., 50 dwellings owner builds. **$400,000.** CD 2/14.

Tex., Houston — Jess Little 2620 Midland St., housing, on 60 acre tract, own forces. **$900,000.** CD 2/10—ENR 2/24.

Tex., Houston—R. A. McWilliams & Assoc., c/o M. Esperson Bldg., 45 dwellings in Oak Forest Sub-division, day labor, **$303,750.** CD 2/18.

Tex., Houston—Lawrence O'Donnell & Assoc. (Suburban Homes Realty Co.) Tidwell Rd., 150 dwellings off Ley Rd., own forces. Approx. **$800,000.**

Tex., Houston — J. Leon Osborn, 3909 Del Monte St., 2 dwellings. Owner builds. **$250,000.** CD 2/14.

●**Tex., Houston** — Plumb-Mitchell, Inc., 4550 Griggs Rd., 300 dwellings, own forces. **$3,000,000.** H. D. Frankfurt, 2539 Southgate St., archt. CD 2/2—ENR 2/17.

Tex., Houston—W. G. Robbins, Sr. 65 12 Del Rio St., housing, 165 homes located in vicinity of Southland Pl. Addn., own forces. Approx. **$650,000.**

●**Tex., Houston** — Southern Builders, c/o S. Hogan, 1200 Givens St., 226 housing units, in Grammercy Park off Telephone Rd. Owner builds. **$1,500,000.**

Tex., Houston — W. E. Stokes, 3831 Drake St., 40 staggered type duplexes Montclair area. Owner builds. **$875,000.**

●**Tex., Houston**—Westview Corp., 4110 Crane St., 218 dwellings in Westview Terrace between Katy and Hempstead Rds. on Silber. Owner builds. Approx. **$1,308,000.** CD 2/11—ENR 2/24.

Tex., San Antonio—Sisters of Charity of the Incarnate Word, 4107 Broadway, science bldg. facing Hildebrand Ave., to Walsh & Burney, 928 N. Flores St., Approx. **$700,000.** Julian & White, Transit Tower, engrs.

●**Alta., Calgary**—Owner, c/o Stevenson, J. M. Canston & Stevenson, archts., 340 Seventh Ave. W., theatre and office, 600 block of Eighth Ave. W., to Larwill Constr. Co., 111 Third St. W., Approx. **$1,125,000.**

Ont., Sarnia—C. T. Laidlow, 111 Norman St., 100 dwellings, 38 acre site, Sarnia Twp., day labor, **$600,000.**

●**Ont., Toronto** — R. Simpson Co., Ltd., 176 Yonge St., 11 story, 95x316 ft. and 75x316 ft., rein.-con. brick, steel department store, to Jackson-Lewis Co. Ltd., 80 King St. W. Est. approx. **$1,000,000.** F. S. Corley, c/o owner, archt. Margison & Babcock, 119 Isabella St., engrs. CD 4/2/47—ENR 4/17/47.

Que., Rouyn—M. Reoux secy. Bd. Trustees Roman Catholic School Comn., P. O. Box 778, soon lets contract 2 story, basmt., 57x123 ft., rein.-con., brick St. Michaels School, Gamble St. Approx. **$250,000.**

INDUSTRIAL BUILDINGS

BIDS ASKED

March 9

Pa., Phila.—ENGINE HOUSE—Baltimore & Ohio R.R. Co., A. C. Clarke, ch. engr., Baltimore and Charles Sts., Baltimore, Md., rebuilding engine house, East side. $250,000.

March 10

La., New Orleans—PLANT—Times-Picayune Publishing Co., 615 North St., printing

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VERTICAL CIRCLE: 4" diameter graduated to ½ degrees on solid silver, with double direct vernier reading to one minute, with removable aluminum guard to circle.

COMPASS: Gold plated needle about 3¾". Compass ring beveled graduated on solid silver to half degrees and numbered in quadrants. Compass box watertight, with variation ring.

HORIZONTAL LIMB: 5-5/16" diameter. Graduated on solid silver to ½ degrees, numbered 0°-360° in two ways, with double-direct vernier reading to one minute, with ivory hinged reflector — too fine spirit levels, sensitiveness about 75 seconds.

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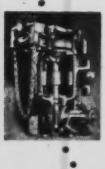

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plant addn. Plans deposit $25. Goldstein, Parham & Labousse, American Bank Bldg., archts.

Tex., Houston—WAREHOUSE, etc.—Houston Oil Field Equip. Co., 2000 S. Wayside Dr., 2 story, bsmnt. warehouse and office. $350,000. Harvin C. Moore, 2008 W. Alabama St., engr. CD 2/16.

March 12

Mont., Sidney—SHOP—Lower Yellowstone Rural Electric Assn., Sidney, headquarters and shop, $50,000. E. G. Osness, Billings, archt.

March 14

●**Colo., Denver** — WAREHOUSE — Western Eelctric Co., Stanley Braken, pres., 195 Broadway, New York, N. Y., 1 story, 320x400 ft. warehouse, E. 40 Ave. between Columbine and Clayton Sts. $2,000,000. Roberts & Schaefer, 130 N. Wells St., Chicago, Ill., engrs. and archts. CD 7/19—ENR 7/22. under LB.

About March 15

Tenn., Chattanooga — PLANT — The Be-Ge Mfg. Co., Gilroy, Calif., mfg. plant, $100,000.

Tenn., Tullahoma—PLANT—Wilson Athletic Goods Mfg. Co., Inc., c/o George D. Grass, Cookeville, plant. $250,000.

March 15

Pa., Marcus Hook — MENS BLDGS. — Sun Oil Co., 1609 Walnut St., Phila., Second St. Men's Bldgs. Over $68,000. W. R. Morton Keast, 1201 Chestnut St., Phila., archt. Bids 6/1 rejected. CD 5/15/47—ENR 5/22/47.

Bids Asked

N. J., West Deptford Twp. (Eagle Point P. O.)—OIL SEPARATOR, etc.—The Texas Co., 134 E. 42 St., New York, N. Y., oil separator bldg. and drainage. Over $150,000. D. W. Carswell, c/o owner, ch. engr.

Pa., Phila.—SERVICE STATIONS—Atlantic Refining Co., 260 S. Broad St., 12 service stations addns., alterations various locations. Over $68,000.

Ont., Ottawa—BUS TERMINAL—Colonial Coach Lines Ltd., Albert St., bus terminal, Albert St. $250,000. C. H. Belford, c/o owner, engr. CD 5/20—ENR 6/6.

SOON LETS CONTRACT

Ala., Huntsville—PLANT—Huntsville Coca-Cola Bottling Co., 414 W. Clinton St., soon lets contract bottling plant addns., alterations. Plans deposit $15. VanKeuren, Davis & Co., American Life Bldg., Birmingham, archts.

Ala., Montgomery — SHOP — Harper-Lee Machine Works, c/o Pearson, Tittle & Narrows, archts., First National Bank Bldg., Montgomery, soon lets contract brick, concrete, steel shop.

●**Calif., East Los Angeles (br. Los Angeles)**—WAREHOUSE, etc., — Union Hardware & Metals Co., 411 E. 1 St., Los Angeles, soon lets contract warehouse and office. $3,250,000. A. C. Martin Assoc., 33 S. Beaudry St., Los Angeles, archts. CD 1/23—ENR 12/3.

Calif., Oleum—PLANT—Union Oil Co., 425 1 St., San Francisco, soon lets contract misc. plant bldgs., addns. Over $70,000.

Conn., Torrington—SALES and SERVICE—Ray Brown, Jr., archt., 60 Main St., soon lets contract 1 story, 50x200 ft., brick, concrete, cinder block, auto sales and service garage and showroom, Midgeon Ave., for Landi Motor Inc., 723 Prospect St. $68,000.

Ga., Atlanta — WAREHOUSE — Western Electric Co., 820 Forrest Rd. N. E., soon lets contract warehouse. CD 1/20—ENR 1/27.

Ill., Mundelein—PLANT—Callaghan & Co., 401 E. Ohio St., Chicago, soon lets contract brick steel plant, Loebl, Schlossman & Urbain, 5 S. Wabash St., Chicago, archts.

Mich., Detroit — WAREHOUSE — Evening News Assn., 615 W. Lafayette St., soon lets contract 1 story, steel, brick marine warehouse. Harley, Ellington & Day, 153 E. Elizabeth St., archts.

Mich., Detroit—WAREHOUSE, etc.—Kinsel Drug Co., 905 Hudson St., soon lets contract 1 story, steel, block warehouse, office. Theodore Rogvoy, 929 Fox Theatre Bldg., archt.

Miss., Picayune—PLANT—Picayune Coca Cola Bottling Co., soon lets contract plant, Hearon & McClesky, 509 Carter Bldg., Hattiesburg, archts.

Ore., Coos Bay—GARAGE—Pacific Greyhound Lines, Curtis and 2 Sts., soon lets contract 46x100 ft. garage. Robert J. Keeney, 32 N. Central Ave., Medford, archt.

Tenn., Nashville—BUS TERMINAL—Central Bus Line, c/o Greer, Holmquist & Chambers, archts., Chamber of Commerce Bldg., Birmingham, Ala., soon lets contract 128x148 ft., concrete, steel bus terminal.

Wis., Milwaukee—FACTORY—Cutler-Hammer Co., 315 N. 12 St., Zone 3, soon lets contract 3 story, L shaped, 61x102x240 ft. part 1 story, rein.-con., steel, brick tool making-heat treating bldg. Eschweiler & Eschweiler, 720 E. Mason St., Zone 2, archts.

Wis., Milwaukee—FACTORY—Western Machine Co., 180 W. Holt Ave., Zone 7, soon lets contract 1 story, 150x150 ft. steel, concrete block factory, concrete fdn. Strass, Bolek & Assoc., 5920 W. North Ave., Zone 8, engrs.

LOW BIDDERS

Ill., North Chicago—FACTORY—Motor Products Corp., 2301 Davis St., rein.-con. factory addn., from Peter Hamlin Constr. Co., 9 S. Clinton St., Chicago, **$290,000.** Awarded 2/14. Exstrand & Schad, 117 N. Genesee St., Waukegan, archts. CD 2/16—ENR 2/24.

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N. J., Camden—FACTORY—Warren-Webster Co., 17 and Federal Sts., 2 story, 72x117 ft., brick factory addn., from Leassle Builders, Inc., 117 S. 17 St., Phila., Pa., **$150,000.** CD 2/11—ENR 2/17.

N. C., Greensboro—PLANT—Kraft Foods Co., 500 N. Peshtigo St., Chicago, Ill., rejected bids Jan 7, food distributing plant. Olson & Urbain, 5 S. Wabash Ave., Chicago, Ill., archts. CD 6/24—ENR 7/8.

Tex., Sherman—Sherman Industries Foundation, Sherman, project abandoned bakery, **$140,000.** CD 2/9—ENR 2/17.—under LB.

Tex., Sugarland—Imperial Sugar Co., Sugarland, Feb. 1, plant alterations, remodeling from Charles R. Baum, 213 Oxford St., Houston, **$460,978.** Addis & Noonan & Assoc., 803 American Hospital & Life Bldg., San Antonio, archts. CD 2/6—ENR 4/1.

CONTRACTS AWARDED

Ala., Birmingham—WAREHOUSE, etc.—Standard Brands, Inc., c/o contractor, warehouse and office, to Brice Building Co., 1021 2 Ave. N. Est. over **$68,000.**

Ala., Opelika — BLEACHERY — Pepperell Mfg. Co., c/o Roberts & Co. Assoc., archts., 96 Poplar St. N.W., Atlanta, Ga., bleachery addn., to Batson-Cook Co., West Point, Ga. Est. over **$75,000.**

Calif., South San Francisco—PLANT—Dubuque Packing Co. of Ohio, 524 2 St., San Francisco, packing plant addns., approx. 55,000 sq. ft. floor area, to Payne Constr. Co., 876 Harrison St. Est. **$500,000.** Henschein, Everds & Crombie, 59 E. Vanburen Ave., Chicago, Ill., archts.

Conn., Bridgeport—FACTORY—Singer Mfg. Co., 803 E. Washington Ave., 5 story, 100x245 ft. and 60x60 ft., brick, steel, concrete factory, Barnum Ave., to Austin Co., 19 Rector St., New York, N. Y., **$800,000.** CD 2/16.

Conn., Stamford—SALES and SERVICE—Healey Buick Co., 11 Elm St., 1 story, 80x125 ft. sales and service showroom-garage bldg., Elm St., to Vuono Constr. Co., 217 Bedford St. Est. **$70,000.** Matthiessen & Johnson, Ripponwam Rd., archts.

Del., Wilmington—WAREHOUSE—Krueger Brewing Co., 506 N. Dupont St., 1 story, 44x122 ft., brick, concrete, steel warehouse, to D. M. Fontana Constr. Co., Inc., 112 9 St., **$80,000.**

Fla., Jacksonville — WAREHOUSE, etc.—Reid Murdock Co., 760 W. Bay St., warehouse and office bldg., Dennis and Lemon Sts., to Consolidated Grocers Corp., 135 S. LaSalle St., Chicago, Ill., **$100,000.** Awarded 2/1.

Fla., Miami — PLANT — June Dairies, c/o Steward & Skinner 223 S.E. 1 St., dairy plant, to Edwards Constr. Co., Coral Gables. Est. **$225,000.** CD 6/25/47—ENR 7/3/47.

Ill., Chicago — FACTORY — Chicago Carton Co., 4200 S. Pulaski St., substructure, 1 and 2 story, 4 factory bldgs., crane bay bldg., brick, steel, concrete, to Carl E. Erickson Co., 4657 N. Ravenswood St. Westcott Eng. Co., 205 W. Wacker Dr., engr. CD 1/6—ENR 1/20.

Ill., Chicago—WAREHOUSE—City Glass Co., 3018 S. Wabash St., 1 story, 108x125 ft., brick warehouse, to Robin Constr. Co., 1099 N. Wells St. Sobel & Stein, 737 N. Michigan St., archts.

Ill., Schiller Park—FACTORY—Soreng Mfg. Co., 1901 N. Clybourn Ave., Chicago, design and construction, 1 story, brick, steel factory, to Siever & Klefstad, 3510 N. Kostner St., Chicago. Est. **$320,000.** Awarded 2/10.

Ind., Marion—PLANT, etc.—Victor Div., Radio Corp. of America, Delaware and Cooper Sts., Camden, N. J., 1 story, 182x442 ft. plant, 1 story, 92x180 ft. warehouse, brick, steel, to Sollitt Constr. Co., 301 S. Columbia St. South Bend. Est. **$500,000.** Awarded 2/17. Oscar R. Knab, R. R. 6, Box 23, South Bend, engr.

●**Ia., Des Moines**—PLANT—Meredith Publishing Co., 1716 Locust St., Des Moines, plant extens., to A. H. Neumann & Co., Hubbell Bldg., **$1,000,000.** Bids 1/5. CD 2/19/48—ENR 3/4/48.

Mo., St. Louis — WAREHOUSE— Pulitzer Publishing Co., St. Louis-Post Dispatch, 12 and Olive Sts., Zone 1, 1 story, 60x180 ft., steel, cement, concrete warehouse, 4326-46 Duncan Ave., to Gamble Constr. Co., 804 Pine St., Zone 1, Wm. C. E. Becker, Ambassador Bldg., 411 N. 7 St., Zone 1, engr.

Mont., Billings—WAREHOUSE—Carter Oil Co., 208½ N. 29 St., 22x100x200 ft., brick, steel warehouse, concrete fdn., to Continental Constr. Co., Denver National Bank Bldg., Denver, Colo., **$146,900.** CD 2/9—ENR 2/17.

N. J., Linden—PLANT—Merck & Co., 126 E. Lincoln Ave., organic chemical mfg. plant, foot of W. Linden Ave., to Walter Kidde Constructors, Inc., 140 Cedar St., New York 6, N. Y. Est. **$354,000.** Amedeo Leone, 4294 W. Buna Vista St., Detroit, Mich.

Pa., Media—SALES and SERVICE—Whitaker-Barrett Co., Front and Orange Sts., sales and service bldg., to Leonard C. Stackhouse, 1st Ave., Broomall. **$68,000.** Francis Jobson, Gulph Rd., Malvern, archt.

Pa., Norristown—FACTORY—United Pipe & Supply Co., Inc., Ford and Washington Sts., 1 story, 122x174 ft., masonry factory addns., alterations, to Charles J. Burns, 103 E. Rambo St., Bridgeport. **$68,000.**

Pa., Phila.—PACKING PLANT—Franklin Provision Co., 226 Callowhill St., 2 addns. 58x99 ft. and 9x99 ft., brick, packing plant addns. alterations, to Brothers Constr. Co., 214 N. 13 St., Over **$68,000.** CD 11/16—ENR 11/18.

Pa., Phila.—TEST—General Electric Co., 6901 Elmwood Ave., design and construction test bldg., to United Engineers & Constructors, Inc., 1401 Arch St. Est. over **$70,000.**

Pa., Phila.—LABORATORY—General Electric Co., 6901 Elmwood Ave., design and construction laboratory, to United Engineers & Constructors, Inc., 1401 Arch St. Over **$70,000.**

S. C., Charleston—PLANT—South Carolina Power Co., 141 Meeting St., hydro-electric plant addn., to C. Y. Thomason, Greenwood, **$306,000.** Awarded 2/16. CD 12/30—ENR 1/20.

Tenn., Kingsport—PLANT—Mead Co., c/o contractor, addnl. plant facilities, to Austin Co., 16112 Euclid St., Cleveland, O., **$431,000.**

Tex., Baytown—AUTO AGENCY—Thad Felton, Baytown, auto agency, to Frank H. Berry, Inc., Baytown. **$150,000.** L. L. Lammars, 2025 Harold St., Houston, archt. CD 2/23.

Tex., Falfurrias — COMPRESSOR PLANT, etc.—LaGloria Corp., Driscoll Bldg., Corpus Christi, 4,800 hp. compressor plant, 30,000,000 cu. ft. casinghead gas daily capacity, to Hudson Eng. Corp., 2711 Danville St., Houston, Approx. **$475,000****laying 18 mi. 12 in. pipeline gathering sys. from production areas to plant, to Altkett Constr. Co., 429 N. Port St., Corpus Christi. Approx **$180,000****coating, wrapping, stringing on route of approx. 18 mi. 12 in. pipeline for gathering sys., to Rossonn-Richards Co., Navigation Blvd., Corpus Christi. Approx. **$75,000,** above work 5 mi. north of here. Grand total approx. $730,000. CD 8/12—ENR 8/26.

●**Tex., Grand Saline**—PLANT—Morton Salt Co., Grand Saline, design and construction plant bldgs. and addns., to K. Ferguson Co., 1783 E. 11 St., Cleveland, O., Approx. **$2,000,000.** CD 2/23.

Tex., Houston—PLANT—Froz-on Co., Pittsburgh, Pa., c/o contractors, antifreeze plant, Green's Bayou, to Austin Co., M & M. Bldg., **$600,000.**

●**Tex., Robert Lee**—PLANT—Sun Oil Co., M. Esperson Bldg., Houston, flare gas recycling plant, own forces. Approx. **$2,000,000.** CD 8/—ENR 8/5.

Tex., San Antonio—SERVICE STATIONS—The Texas Co., 400 Probandt St., Service Stations 7 and 10, Highland and South Hackberry and S. Presa and Mt. Vernon Sts., to Thurman Barrett, Jr., P.O. Box 6093, Harlandale Station. **$75,000.**

Tex., Waco—PLANT—General Tire & Rubber Co., 1708 E. Market St., Akron, O., plant expans., own forces. **$125,000.** CD 3/2/48—ENR 3/18/48.

Utah, Midvale—WAREHOUSE, etc.—General Mills Corp., 3287 Highland Dr., Salt Lake City, building to house warehouse storage, store, offices, shops, garage, etc., 9600 S. State St., to Cannon Constr. Co., 959 S. 7 West St., Salt Lake City. Est. **$125,000.** General Mills Corp., 400 2 Ave. S., Minneapolis, Minn., archt.

Utah, Salt Lake City—GARAGE—Continental Baking Co., 734 E. South St., brick bldg. housing garage, paint shop and repair shop, to Mark R. Garff & Co., P. O. Box 1204, **$80,000.** Fetzer & Fetzer, Templeton Bldg., archts.

Utah, Salt Lake City—WAREHOUSE—E. D. Schettler, 5815 Holladay Blvd., new repair, maintenance and warehouse bldg., own forces. Est. **$500,000.**

●**Ont., Hamilton**—PLANT—Canadian Westinghouse Co. Ltd., 286 Sanford Ave. N., 1 story, 120x525 ft. rein.-conc., brick, steel plant, Beach Rd., east of Strathearne Ave., to Frid Constr. Co. Ltd., 128 King St. E. Approx. **$1,000,000.** CD 1/27—ENR 2/3.

Ont., Peterborough—PLANT—Outboard Marine & Mfg. of Canada, Ltd., Peterborough, plant extens., to Richard Ryan, Ryan, 1308 William St., Montreal, Que., **$500,000.**

UNCLASSIFIED

BIDS ASKED

March 7

D. C., Wash.—RAILROAD SIDING—Dist. Comrs., District Bldg., railroad siding and approaches to Transfer Station, New Jersey Ave. to K St. S. E.

March 8

Georgia—POWER LINES—Rayle Electric Membership Co-operative, Washington, 303.89 mi. primary secondary and service electric power lines in Greene, Hancock, Lincoln, Oglethorpe, Wilkes and Taliaferro Counties. Plans deposit $25. J. B. McCrary Eng. Corp., 22 Marietta St. Bldg., Atlanta, engrs. CD 10/38—ENR 11/4.

Ontario—POWER DEVELOPMENT EXCAVATION—Public Supply of Hydro Electric Comn. of Ontario, 620 University Ave., Toronto, diversion channel excav., La Cave power development, incl. Part A, 194,000 cu. yd. and Part B, 363,000 cu. yd. excav. Plans deposit $25. CD 5/19—ENR 6/10.

March 9

†**Conn., New Haven**—FACILITIES, etc.—District P. Wks. Office, Third Naval Dist., Hudson Terminal Bldg., 50 Church St., New York, 7, N. Y., addnl. facilities, imprvs., Naval Reserve Training Center, Spec. 21903.

†**Conn., Waterbury** — FACILITIES, etc. — District Pub. Wks., Third Naval Dist., Hudson Terminal Bldg., 50 Church St., New York, 7, N. Y., addnl. facilities, imprvs., Naval Reserve Training Center, Spec. 21933.

†**Fla., Green Cove Springs**—FENCE—Construction Officer, Charleston Naval Shipyard, Naval Base, S. C., installing 7,302 ft. 72 in. chain link fence, appurtenances at Naval Station, Spec. 21495. Plans deposit $10.

†**Fla., Panama City**—POLE LINE, etc.—Constr. Officer, Charleston Naval Shipyard, Naval Base, S. C., approx. 3,300 ft. 11 kw. three phase four wire pole line and appurtenance, substation, etc., Spec. 20951. Plans deposit $10.

March 10

●**Ill., Chicago**—SUBWAY SWITCHBOARD, etc.—City, Dpt. Purchases, Supplies & Contracts, City Hall, furnishing, installing switchboards, electrical cabinets, conduits, wires, etc., Dearborn St. Subway Contr. E-3. Bids Dec. 8 rejected, L. B. $1,367,411. CD 12/14—ENR 12/23, under LB.

March 15

La., Bogalusa—FIRE ALARM SYSTEM—City, City Hall, fire alarm sys. Plans deposit $15. Extended date. Joseph D. Martinez, P. O. Box 1467, Baton Rouge, engr. CD 2/1.

Tex., Camp Hood — PARKING HARDSTANDS, etc.—U. S. Eng., 606 Santa Fe Bldg., Galveston, motor parking hardstands, loading platform imprvs., paving 2 parking areas, 1100x1170 ft. and 1015x1097 ft. with 4 in. asphaltic conc. & 8 in. flex. base, tear down 12 wooden loading platforms and reconstruct of rein.-con. Inv. No. 41-243-49-228. $90,000. Tentative date.

March 17

†**Arizona and Nevada**—BUS STRUCTURES, etc.—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. to cars shipping point or f.o.b. cars Kingman (Louise) Ariz., and Boulder City, Nev., bus structure, switch supports, tie-down frames, take-off structure, for 230 kv switchyard, Davis Power Plant, Davis Dam Proj., Spec. 2583. L. N. McClellan, ch. engr.

Calif., Los Angeles—SWIMMING POOL, etc. —City, Dpt. Park & Recreation Comn., City Hall, swimming pool, team room, bath house at Cheviot Hills Playground. $250,000. Plans deposit $25. Dwight Gibbs, 257 S. Spring St., Los Angeles, archt.

SOON LETS CONTRACT

Calif., Sacramento — MAUSOLEUM — Sacramento Diocese of Roman Catholic Church, Sacramento, soon lets contract mausoleum addn. at St. Mary's Cemetery. Over $250,000. Harry J. Devine, 1012 J St., archt.

LOW BIDDERS

●**Ala., Montgomery**, LIVESTOCK COLISEUM —State Bldg. Comn., 702 Washington St., Feb. 18, livestock coliseum for State Agricultural Dpt., from J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C., **$1,593,000.** Est. $1,500,000. CD 1/20—ENR 1/27.

†**Ark., Fort Smith**—CEMETERY BLDG.—U. S. Eng., Government Aircraft Plant 3, 2000 North Memorial Dr., Tulsa., Okla., rejected bids Jan. 27, utility bldg. and permanent facilities, Fort Smith National Cemetery, Inv. No. Eng-34-066-49-63. Will readvertise. CD 1/13—ENR 1/20.

Calif., San Francisco—OVERHEAD TROLLEY INSTALLATION—Pub. Utilities Comn., City Hall, Feb. 15, overhead trolley installation at Potero Trolley Coach House, Spec. 324, from Abbett Electric Corp., 472 Tehama St., **$120,303.** CD 2/2.

La., Angola—LAYING GAS PIPE—State Div. Admin., Capitol Annex, Baton Rouge, Feb. 15, laying gas pipe on transmission line from 22 in. gas main of Interstate Natural Gas Co. of West Feliciana Parish, from Holland Constr. Co., Magnolia, Ark., **$98,257.**

La., Simmesport—NATURAL GAS SYSTEM —Mayor, Simmesport, Feb. 15, natural gas transmission line, distr. sys., from Brand & Lambers, Gonzales, **$113,406.** CD 2/3.

†**Tennessee**—TRANSMISSION SYSTEM—U. S. Eng., 303 U. S. Courthouse, Nashville, Zone 3, one 15 kva oil filled pipe-cable transmission sys. Center Hill Dam Serial No. Eng-40-058-49-40, from General Electric Co., River Rd., Schenectady, N. Y., **$106,864.**

Tenn., Memphis—CABLE—Memphis Light, Gas & Water Div., Memphis, 115 kv cable serving South Memphis industrial area, from Shelby Electric Co., 112 E. Iowa Ave., **$687,500.**

†**Washington**—TRANSMISSION LINE, etc. —Bureau Reclamation, Dpt. Interior, Yakima, Feb. 15, 34.5 kilovolt and 13.8 kilovolt transmission lines and 2.4 kilovolt distr. line for Roza Div. Pump Plants, Roza Div. Yakima Proj., Spec. 1510, copperweld-copper conductor, from Donald W. Close Co., 2727 11 St. N., Seattle. **$234,685.**

Ont., London—ARENA, etc.—Western Fair Assn., W. D. Jackson, genl. mgr., Queens Park, livestock portion of coliseum, and sports arena, Queen's Park, from Sterling Constr. Co. Ltd., 2494 Sandwich St. E., Windsor, Approx. **$500,000.** J. C. McBride, c/o owner, archt. CD 12/31/45—ENR 1/10/46.

CONTRACTS AWARDED

†**Arizona-California-Nevada**—TRANSFORMERS—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., seven 30,000kva. transformers for Hoover Power Plant, Boulder Canyon Proj., Spec. 2449, to General Electric Co., 650 17 St., Denver, Colo., **$580,000.** Est. $586,366. Bids 11/9. CD 12/1—ENR 1/29.

†**Arizona and Nevada**—TRASHRACKS—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Den. Federal Center, Denver, Colo., Feb. 15, 300 trashracks for intake structures at Davis Power Plant, to Schnabel Co., S. 10 St., Pittsburgh, Pa., **$65,000,** f.o.b. Pittsburgh. CD 1/18—ENR 1/25.

Conn., Norwich — FIRE PROTECTION — State, Ray Thatcher, comptroller, State Capitol, Hartford, fire protection installing institution fire sys., Norwich State Hospital, to Stephen Fainer, Colony St., Ansonia, **$62,000.** Hill Harrigan, Audubon Ave., New Haven, engrs.

Ga., Sylvania—MOTOR COURT—Connie F. Lane, Sylvania, motor court. Owner builds. **$100,000.**

Pa., Phila.—TELEVISION TRANSMITTER—Triangle Publications, Inc., Widener Bldg., television transmitter bldg. and tower, Umbria St., to R. M. Shoemaker, 1619 Sansom St., **$80,000.** CD 2/1.

Tenn., Nashville — STADIUM — Vanderbilt University, Nashville, steel west side of football stadium addn., to Nashville Bridge Co., foot of Shelby Ave. **$159,000.** CD 12/2—ENR 12/30.

Tex., Bishop — GYMNASIUM, etc. — Bishop School Dist., Bishop, school gymnasium and stadium, to Davis Constr. Co., 117 Vanderbilt St., Corpus Christi, **$138,804.** Bids 2/17. Carroll V. Turner, 3340 Floyd St., Corpus Christi, archts. CD 2/2—ENR 2/17, under Public Bldgs.

Tex., Colorado City—DAM—Texas Electric Service Co., Electric Bldg., Fort Worth, Morgan Creek Dam for generating electric power and furnishing water, to Harry Campbell, 2854½ Berry St., Fort Worth, **$525,000.** CD 2/11—ENR 2/17, under LB.

Tex., Dallas—BASEBALL PARK IMPRVS. —Dallas Baseball Club, Inc., 1500 E. Jefferson St., baseball park imprvs., day labor. **$75,000.**

Tex., Fort Worth—POWER LINES—City, P. Wks. Dpt., Light & Power Div., City Hall, power line replacement repairing, reconditioning, force account. **$150,000.** CD 2/3—ENR 2/17.

Tex., Houston—STREET LIGHTS—Houston Lighting & Power Co., 1016 Walker St., 201 addnl. large street lights, Purchase and Hire **$90,000.**

Utah, Salt Lake City—SWIMMING POOLS —City, Mrs. Irma Bitner, recdr., City and County Bldg., swimming pools at Jordan and Liberty Parks, to Jacobson Constr. Co., 724 S. 3 East St., **$131,500.** R. N. Perkins, 2884 Newport St., Omaha, Neb., consult. engr., W. D. Beers, city engr. CD 5/24/44—ENR 6/1/44.

Wis., Milwaukee—STEAM HEATING—Wisconsin Electric Power Co., 231 W. Michigan St., Zone 3, reconstructing part of low pressure steam heating distr. sys. in downtown area, own forces. **$105,000.** H. L. Warhanek, c/o owner, engr.

CONSTRUCTION REPORTS— Third Section

WATER SUPPLY

BIDS ASKED

March 9

N. Y., New York—Comr. Water Supply, Gas & Electricity, Municipal Bldg., Zone 7, hauling, laying removing low and high pressure watermains, appurtenances in Cherry, Front, Madison, Pearl, South and Water Sts., New Bowery and in grounds of Governor Alfred E. Smith Houses. Plans deposit $1.

March 10

N. Y., New York—Comr. Water Supply, Gas & Electricity, Municipal Bldg., Zone 7, hauling, laying watermains, appurtenances, in Harris and 3 Aves., E. 143 and E. 145 Sts., and in grounds of Patterson Houses, Bronx Boro. Plans deposit $1.

LOW BIDDERS

La., Marrero—Jefferson Parish Waterworks Dist. 3, Marrero, Feb. 16, water distr. sys., from Clement Betpouey Jr. & Co., Canal Bank Bldg., New Orleans, **$32,393.** CD 2/1—ENR 2/3.

Mass., Boston — Commonwealth of Mass., Metropolitan Dist. Comn., 20 Somerset St., Boston, Feb. 24, installing hydraulic turbine generator motor-operated disc valve switchgear sub-station and appurtenances, Quabbin Aqueduct, West Boylston. Contr. 153, from F. E. Daddario Corp., 73 Tremont St., Boston, **$86,266.** CD 2/4—ENR 2/10.

N. C., Tabor City—Town, water extens., to George T. Sprice, Fayetteville, **$54,944.** Bids 2/18. Paul M. Van Camp, Southern Pines, engr.

Tex., Lampasas—City, Lampassas, water treatment and filtration plant, purchase and Hire, **$45,000.** Marvin Turner Engineers, Nalle Bldg. Annex, Austin, engrs.

SEWERS, WASTE DISPOSAL

BIDS ASKED

March 15

Calif., Sacramento—State Div. Architecture, P. Wks. Bldg., sewer collection and disposal sys., water sys. addns. for Division of Beaches & Parks, Pfeiffer Big Sur State Park. Anson Boyd, Sacramento, state archt.

March 21

Calif., Stockton—City, City Hall, sewage disposal plant, $725,000. Plans deposit $10. H. M. Dunlap, City Hall, city engr. CD 2/28.

March 22

Calif., Los Angeles—Los Angeles Co., Hall of Records, sanitary sewers in Church St. $135,915. Extended date. C. E. Arnold, co. engr. and surv.

LOW BIDDERS

Pa., Warren—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, Feb. 24, imprv. sanitary disposal plant at Warren State Hospital from Keystone Constr. Co., Meadville, **$51,936.** CD 2/1—ENR 2/10.

R. I., Warren—Town, Felix Brochu, consr. Sewers, Feb. 10, sewage treatment proj. incl. grit chambers, chlorination, 17x22 ft. sludge pump house, 35x52 ft. sedimentation tank, 30 ft. digestion tank, 20x36 ft. control house, 40x 112 ft. sludge beds from Westcott Constr. Co., 52 N. Washington St., North Attleboro, Mass., **$285,900.** CD 1/5—ENR 1/27.

CONTRACTS AWARDED

Que., Montreal—Municipality, trunk sewer in Maisonneuve Ward, to Key Constr. Ltd., 1040 Bleury St., **$732,902.** CD 1/24—ENR 1/27, under LB.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

March 8	**March 15**
Maryland	**Maryland**
Michigan	**March 16**
March 11	**California**
Kentucky	**March 23**
	Louisiana

March 18

Pa., Phila—Dpt. Pub. Wks., City Hall Annex, reconstructing Bridge 11, South Street over the Schuylkill River, (West Approach). Thomas Buckley, dir.; adv. ENR 3/3. CD 2/26/47—ENR 3/20/47.

March 22

N. Y., New York—Dpt. P. Wks., Municipal Bldg., zone 7, reconstructing roadway, sidewalks and truss bearings and altering operators house of the University Heights Bridge over the Harlem River between the Manhattan and Bronx Boros. Plan deposit $25.

March 29

Wisconsin and Minnesota—State H. Comn., Madison, Wis. and Comr. Hys., Minnesota, St. Paul, Minn. at office Wisconsin State Hy. Comn., Madison, Wis.,

St. Croix Co., Wis.—Contr. 1, subway structure, of the Hudson Interstate Bridge and Approaches, U. S. Hy. 12, Proj. FI 06-5 (9). CD 11/22/44—ENR 12/14/44.

LOW BIDDERS

Kan., Kansas City—City, City Hall, Feb. 17, repairing Central Ave. viaduct, from George Bennett Constr. Co., 1520 Central Ave., **$849,693.** CD 2/8—ENR 2/10.

Tex., Corpus Christi—Nueces Co, Courthouse, Feb. 25, Causeway Proj. between Corpus Christi and Padre Island from Bauer & Smith Dredging Co., Port Lavaca, **$1,248,608.** Est. $1,700,000. CD 2/8—ENR 2/10.

Wisconsin and Minnesota—State Hy. Comn., Madison, Wis., and Comr. Hys. State of Minnesota, St. Paul, Minn., at office Wisconsin State Hy Comn., Madison, Wis., Hudson Interstate Bridge and approaches, U. S. Hy. 12. Contr. 1, 0.465 mi. Proj. FI 06-5 (6) and FI 06-5 (7) St Croix Co., Wis., and Washington Co. Minn., from Industrial Contg. Co., 3050 Fourth Ave. S., Minneapolis, Minn., **$804,305.** CD 2/2—ENR 2/10.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

March 8	**March 15**
Maryland	**Kansas**
Michigan	**March 16**
West Virginia	**California**
March 9	**March 17**
Louisiana	**California**
March 11	**March 23**
Kansas	**Louisiana**
Kentucky	

March 7

Que., Shawinigan South—P. E. Hamel, secy., Municipality Shawinigan South, 7,000 ft. sidewalks, 4 ft. wide.

March 9

Ark., Booneville—Street Imprvt. Dist. 1, Booneville, approx. 106,000 sq. yd. paving, $140,000. Plans deposit $25. Max A. Mehlburger, Pyramid Bldg., Little Rock, engr. CD 10/7—ENR 10/14.

New York—President Richmond Boro, Boro Hall, St. George, Staten Island, Zone 1, constructing or repairing sidewalks on various locations in Richmond Boro, etc., Contr. 4.

March 15

Calif., San Diego—City, Civic Center Bldg., imprv. Imperial Ave. between 55 St. and Imerlin Dr. Over $50,000. Alden K. Fogg, city engr. CD 12/6/44—ENR 12/28/44.

Bids Asked

R. I., Providence—City of Providence Housing Auth., Chad Brown St., 8,322 sq. yd. bit. macad. roads, incl. curbing at housing $55,000. CD 7/19—ENR 8/5.

LOW BIDDERS

●**Ill., Chicago**—City, Dpt. Purchases, Contracts & Supplies, City Hall, Feb. 24, imprv. W. Randolph St. to W. Lake, Wacker Dr. exten., two level roadway from Wacker Dr. to Harlem approaches in W. Randolph St., etc., from Herlihy Mid-Continent Co., 79 W. Monroe St., **$1,052,493.** CD 2/3—ENR 2/10, c. conc N. Damen Ave., from W. Lawrence to W. Balmoral Aves. from W. J. Sheppard & Co., 1412 W. Altgeld St., **$223,953.**

Massachusetts — Commonwealth of Mass. Dpt. P. Wks., 100 Nashua St., Boston, Feb. 21, bridge approaches, FAGM FG 182 (5), Ayer, from Daniel DiNitto's Sons, 712 Main St., Leominster, **$235,996.** CD 2/9—ENR 2/17.

Tex., Beaumont—Jefferson Co., Courthouse, flexible base course, and b. conc. 12 mi. on Groves Tex. streets, from Trotti & Thompson, Inc., 2940, Crockett St., **$180,000.** Charles L. Davidson, co. engr.

CONTRACTS AWARDED

Mich., Detroit — State Hy. Dpt., Lansing, altering city water sys., storm sewer in John C. Lodge Expressway, to Sugen & Sivier, Inc., Hazel Park, **$75,203.** Bids 1/27. CD 1/12—ENR 1/20.

Tex., Centerville—Leon Co. c/o Courthouse, farm-to-market road constr. 6 mi. between Centerville and Middleton in Precinct 1, **$55,000;** 6 mi. between Leona and Spiller's Store, Precinct 1, **$50,000,** force account.

EARTHWORK, WATERWAYS

BIDS ASKED

March 17

✦**Calif., Crescent City**—U. S. Eng., 74 New Montgomery St., San Francisco, about 1700 ft. rubble breakwater, Spec. 04-203-49-12.

LOW BIDDERS

●✦**Oreg n**—U. S. Eng., Pittock Block, Portland, Feb. 24, concrete, gravity dam complete with outlet gates and valves, penstocks, trashracks, stilling basin, control house, Detroit Dam, 12 mi. east of Mill City, Marion Co. No. 35-026-49-333, from Consolidated Builders, Inc., Swan Island, Portland, **$28,230,509.** Est. **$31,541,856.** CD 12/15—ENR 12/23.

CONTRACTS AWARDED

✦**Rhode Island**—U. S. Eng., Bldg. 21, Naval Drydocks, Boston, Mass., 2 sects. of breakwater, 825 and 1,130 ft. long, riprack constr., Wickford Harbor, to Whaling City Dredge & Dock Corp., Buell St., Groton, Conn., **$115,000.** Bids 2/10. CD 1/17—ENR 1/27.

AIRPORTS AND AIRBASES

LOW BIDDERS

Minn., Minneapolis — RUNWAY—Metropolitan Airports Comn., 2429 University Ave., St. Paul, exten. north-south runway, Wold-Chamberlain Field, from Woodrich Constr. Co., 405 Library Exchange, **$114,963.** CD 9/17—ENR 9/23, under LB.

PUBLIC BUILDINGS

BIDS ASKED

March 8

Me., Madawaska—Town, Town Hall, 1 story, brick, concrete high school, **$350,000.** Plans deposit $25. Bunker & Savage, 283 Water St., Augusta, archts., CD 11/9/45—ENR 12/27/45.

Mo., Farmington—Dpt. P. Health & Welfare, Sam Marsh, dir., and Div. P. Bldgs., John F. Powell, dir., Jefferson City, alterations, boiler plant, State Hospital 4. Plans deposit $10. Wm. B. Ittner, Inc., 408 Bd. Educ. Bldg., 911 Olive St., St. Louis, Zone 1, archt. CD 9/25/47—ENR 10/16/47.

March 9

Mass., Boston—City Traffic Dpt., 134 North St., 1 story, and 2 story office section, concrete traffic bldg., Southampton and Atkinson Sts. **$400,000.** Plans deposit $50. John M. Gray, 175 High St., archt. CD 2/10—ENR 3/3.

March 10

Mass., Holden—Town, Bldg. Comn., E. V. Pyl, chn., 52 Holden St., Rice School. Approx. $250,000. Plans deposit $35. L. W. Briggs Co., 90 Park Ave., Worcester, archt.

Neb., Kearney—State Bd. Control, Lincoln, dormitory at Boys Training School. $350,000. Hellenberg & Hellenberg, 2412½ Central Ave., archts. CD 21/9/46—ENR 12/26/46.

Tex., Galveston—John Sealy Hospital Foundation, 2324 Strand St., one 6 story and three 3 story hospital bldgs. Extended date. C. H. Page & Sons, 305 W. 11 St., Austin, archt. R. E. Rolfe, 2204 Griffin St., Dallas structural engr. Zumwalt & Vinther, 1807 Mercantile Bank Bldg., Dallas, mechanical engrs. CD 2/25—ENR 3/3.

March 11

Okla., Oklahoma City—Bd. Educ., N. L. George, 400 N. Walnut St., Junior-Senior High School. $500,000. Hudgins, Thompson, Ball & Assoc., 1100½ W. Main St., archts. CD 2/15—ENR 2/17.

March 16

N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, general constr., plumbing, heating, ventilating and refrigeration, electrical work and lighting fixtures for Chronic Disease Hospital (City Home Replacement) (Bird S. Coler Memorial Hospital and Home) on Welfare Island. Plans deposit $150 for general, $100 for others. Extended date. CD 1/17—ENR 1/27.

Tex., Sundown—Sundown Independent School Dist., Sundown, masonry high school, stadium, fieldhouse. $300,000. Plans deposit $25. Buford & Feinberg, 1801 San Jacinto St., Dallas, engrs. and archts.

March 17

North Carolina—National Guard Bureau, Justice Bldg., Raleigh, motor vehicle storage bldgs., at Mt. Airy, Durham, Roxboro, Forest City, North Wilkesboro, and Lenoir. Plans deposit $25. Extended date CD 2/8—ENR 2/10.

March 18

N. Y., Brooklyn—Bd. Transportation, 250 Hudson St., New York, Zone 13, general constr., plumbing, fire protection for Ulmer Park Bus Garage, 25 and Harway Aves., Contr. 3.

March 21

N. M., Portales—Eastern New Mexico College, Portales, womens dormitory, $250,000; student union, $285,000. Schaefer & Merrell, Clovis, archts. CD 11/15/47—ENR 11/30/44.

N. C., LaGrange—Lenoir County Bd. Educ., E. E. Sams, supt. Schools, Kinston, 2 story Consolidated Negro school. Wm. A. Coleman, Kinston, archt. CD 2/11.

March 22

N. Y., New York—New York City Housing Auth, 63 Park Row, Zone 7, foundations and

(Continued on page 114)

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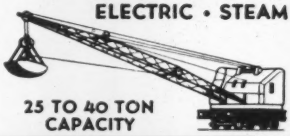

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1x2—36"	8.80	8.00
2x2—12	6.50	5.90
2x2—15"	8.15	7.00
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2x2—24"	10.45	9.50
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(Continued from page 112)

general constr., heating and ventilating, electrical work, plumbing for Parkside Houses, Proj. NYC-17, in area bounded by Bronx Park East, Adee Ave., White Plains Rd. and Arnow Ave., Bronx Boro. Plans deposit $75. CD 11/26—ENR 12/9.

March 24

Conn., Danbury—City, Danbury Memorial Assn., G. A. McLachlan, chn., center part 2 story, brick, rein.-con. War Memorial Community Center, $500,000. Plans deposit $30. Philip N. Sunderland, Inc., 81 West St., archt. CD 1/25—ENR 12/7.

†Me., Caribou—U. S. Eng., Bldg. 7, Camp Keyes, Augusta, motor vehicle storage bldg., Serial No. Eng., 17-018-49-01. Extended date. CD 1/28—ENR 2/3.

†Me., Gardiner—U. S. Eng., Bldg. 7, Camp Keyes, Augusta motor vehicle storage bldg., Serial No. Eng. 17-018-49-01. Extended date. CD 1/28—ENR 2/3.

†Me., Millinocket—U. S. Eng., Bldg. 7, Camp Keyes, Augusta, motor vehicle storage bldg., Serial No. Eng. 17-018-49-01. Extended date. CD 1/28—ENR 2/3.

March 29

†N. M., Aubuquerque—U. S. Eng., P. O. Box 1538, 100x600 ft., concrete frame warehouse at Sandia Base, air-conditioning. Serial No. 291-49-16. $800,000. Plans deposit $25. CD 2/23—ENR 3/3.

March 30

Ala., Birmingham—City, Ramsey High School Gymnasium $700,000; West End High School Gymnasium, $700,000. Warren, Knight & Davis, Protective Life Bldg., archts. CD 8/25—ENR 9/2.

Fla., Miami Beach—City, Feb. 24, Electric Power Plant 2, from George D. Auchter Co., foot of E. 56 St., **$2,488,800.** CD 1/4—ENR 2/3.

●†Ia., Ames—U. S. Atomic Energy Comn., P. O. Box 16 A, Station A, Feb. 16, research laboratory at Iowa State College, from James Thompson & Sons, 222 E. Third St., **$1,749,000.** CD 1/17—ENR 1/20.

Kan., Lawrence—State Bd. Regents, Topeka, Feb. 17, general contract womens hall addn. University of Kansas, from Basin Green, Peoples Bank Bldg., **$551,420.** CD 2/8—ENR 2/10.

Mass., Cohasset—Town, Town School Dpt., cancelled bids to have been opened Feb. 11, high school, $900,000. CD 1/4—ENR 1/13.

Mass., Oxford—Town, School Dpt., Oxford, Feb. 3, high school, from Vara Constr., Inc., 718 Huntington Ave., Boston, **$416,000.** Bids 11/30, rejected. CD 12/14—ENR 12/16, under LB.

Mass., Weymouth—Town, E. S. Mapes, supt. schools, 89 Middle St., East Weymouth, Feb. 18, 2 school addns., from John Hamre & Son, 55 Buckingham Rd., Quincy, **$393,000,** alt. bid **$333,000.**

†N. M., Alburquerque—U. S. Eng., P. O. Box 1538, 1,000-man mess hall, from Robert E. McGee, P. O. Drawer 562, El Paso, Tex., Item 1 **$314,200,** Item 2 **$368,700.** CD 2/8—ENR 2/10.

N. Y., Valley Stream—Bd. Educ., Union Free school Dist. 13, Rockaway Parkway, school, North Valley Stream, from Jonwal Constr. Co., 220 W. 42 St., New York, Zone 18, **$447,300.** CD 2/7—ENR 2/10.

●†Tex., Dallas—U. S. Eng., 606 Santa Fe Bldg., Galveston, project indefinitely postponed, 500 bed Veterans Admin. Hospital for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C., Dist. **$8,000,000-$14,000,000.** CD 8/23—ENR 8/26.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., Feb. 24, concrete, steel Berry School, from I. G. Audish, 1911 Holfahl St., base bid **$477,760.** CD 1/18—ENR 1/20.

Tex., Palestine—Anderson Co., c/o Judge, Courthouse, cancelled bids to have been opened Mar. 1, 60 bed, masonry, concrete, steel Sarah Cartmell Memorial Hospital. **$594,900.** Will readvertise. CD 2/9—ENR 2/17.

Wis., Eau Claire—Bd. Educ., Eau Claire, Feb. 17, general contract, 10th Ward School addn., alterations, from L. G. Arnold, Eau Claire, **$303,641.** CD 1/25—ENR 1/27.

Proposal Advertisements see pp. 114 to 117
Proposed Projects see p. 92

OFFICIAL PROPOSALS

Bids: March 29, 1949 (877)

Dredging and Appurtenant Work

NOTICE TO BIDDERS

Bid Date March 29, 1949

The Commonwealth of Pennsylvania will receive sealed proposals through the Water and Power Resources Board, Department of Forests and Waters, Room 404, Education Building, State Capitol, Harrisburg, Pennsylvania until 1:30 P.M. o'clock Eastern Standard Time, Tuesday, March 29, 1949, which will be publicly opened and read at that time for:

Contract No. 24. For Dredging, Floodway Clearing and Excavation in River Section II of the Schuylkill River Pennsylvania.

Contract No. 25. For Dredging, Floodway Clearing and Excavation in River Section IV of the Schuylkill River in Pennsylvania.

Plans, Specifications, General Conditions and Proposal forms may be examined free of charge or complete sets not exceeding three (3) copies may be secured by prospective bidders by applying to Schuylkill River Projects Engineers, 20 S. Fifteenth Street, Philadelphia, Pennsylvania upon making a deposit of fifty dollars ($50.00) per set. *This deposit will be refunded only upon the return of the plans and specifications in good order within ten (10) days after the opening of bids.*

Each proposal must be accompanied by a proposal guarantee in the form of a certified check, bank cashier's or bank treasurer's check drawn to the order of the Commonwealth of Pennsylvania in the amount stated below.

Contract	Proposal For	Cost One Set Plans & Specs.	Proposal Guaranty
24	Dredging, Floodway Clearing & Excavation in River Section II.	$50.00	$125,000.00
25	Dredging, Floodway Clearing & Excavation in River Section IV.	$50.00	$125,000.00

A Joint Venture bid will not be considered and all proposals must be completely filled out, signed, executed and sealed in special bid envelope.

Attention is called that Article No. 10 of the Business Corporation Law approved May 5, 1933, P. L. 364 requires a foreign corporation, before doing business in this Commonwealth, to procure a Certificate of Authority to do business in Pennsylvania, from the Pennsylvania Department of state.

The Commonwealth of Pennsylvania reserves the right to reject any or all bids.

COMMONWEALTH OF
PENNSYLVANIA
Department of Forests and Waters
M. F. DRAEMEL, Secretary

Bids: March 24, 1949 (903)

Construction of Chicopee Valley Aqueduct

COMMONWEALTH OF
MASSACHUSETTS
METROPOLITAN DISTRICT
COMMISSION

Sealed proposals will be received at the office of the Metropolitan District Commission, 20 Somerset Street, Boston, Mass., until 1:00 P.M., Eastern Standard Time, Thursday, March 24, 1949, and then publicly opened for Contract 168 for the construction of Section 4 of the Chicopee Valley Aqueduct, including the Nash Hill Reservoir, in the Town of Ludlow, Mass. The pipe for section 4 will be furnished by the Commission on certain storage areas along the aqueduct line. The work consists of constructing about 9000 feet of cut-and-cover aqueduct, using this pipe which is generally 36-inches inside-diameter precast-concrete pipe; includes the building of appurtenant structures such as manholes, culverts and other structures; and includes the construction of an open storage reservoir formed by earth excavations and embankments; of the gate-house foundations and superstructure, and of the connecting steel-plate, concrete encased, mortar-lined pipe lines, the installation of equipment in the gatehouse, the placing of the riprap, stone and concrete protections of the reservoir slopes, the construction of an access road to the gatehouse, and other works appurtenant to the reservoir construction. Each bidder shall deposit security in an amount not less than $18,000.

OFFICIAL PROPOSALS

A bond in at least the full amount of the contract will be required of the successful bidder to secure the faithful performance of the contract, and for the payment of all persons performing labor or furnishing materials in connection therewith. Special attention is called to the requirements as to conditions of employment to be observed and to the minimum rates of wages prescribed by the State Commissioner of Labor and Industries. A schedule of such rates is included in the contract and a copy may be obtained at the office of the Metropolitan District Commission. The information for bidders, and the prescribed forms of proposal, contract, and performance bond, and plans and specifications may be examined at the above address, and copies thereof obtained from Karl R. Kennison, Chief Engineer of the Construction Division, upon the deposit of $10, to be refunded only to bidders or others returning them within ten days after the opening of bids. The site of the work and the existing conditions at and near the aqueduct line may be seen by applying at the office of the Head Construction Engineer, Administration Building, Belchertown, Mass. The Commonwealth reserves the right to waive any informality in, or to reject, any or all proposals. No bidder may withdraw his bid within thirty days after the actual date of the opening thereof. A proposal which includes for any item a bid that is abnormally low or high may be rejected as unbalanced.

WILLIAM T. MORRISSEY,
Commissioner

February 24, 1949

U. S. Government

Federal Works Agency, Public Buildings Administration, Washington, D. C., Feb. 17, 1949.—Sealed bids in duplicate for Construction of Utility Building at the National Institute of Health at Bethesda, Maryland will be received until 1:00 P.M. Standard Time, on March 24, 1949, in Room No. 1125, Federal Works Agency Building, Washington, D. C., and then publicly opened in Room No. 1126. Bid guarantee is required. If the amount of the contract exceeds $2,000, U. S. Standard Form No. 23, Construction Contract, will be used and performance and payment bonds will be required. Upon request one set of Prebid Documents and 2 sets of drawings and specifications will be supplied without charge to each general contractor interested in bidding on the complete project, all of which must be returned. Additional sets of drawings and specifications may be obtained by general contractors at a charge of $15.00 per set, which will not be refunded. Checks offered as payment must be made payable to the order of the Treasurer, U. S. Upon request and in the discretion of the undersigned one set of drawings and specifications will be furnished to builders' exchanges, chambers of commerce and other similar organizations, with the understanding that the set will be retained on their premises and made available for inspection by any interested subcontractor or material firm. Bidding material may be obtained at Room No. 507 Lemon Building, 1729 New York Ave., N. W., Washington 25, D. C., Phone EXecutive 4900, Extension 2397. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

(880)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. 2577) will be received by Bureau of Reclamation, Denver, Colorado, until 2 p. m., March 24, 1949, and then publicly opened for furnishing three 13-foot 6-inch diameter, welded-plate-steel penstocks, one 13-foot 0-inch diameter, welded-plate-steel pump intake, and four welded-plate-steel outlet conduit liners for Canyon Ferry Unit, Montana, Missouri River Basin Project. Delivery is desired within 365 days. For particulars, address the Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.

(886)

(Continued on page 115)

CONTRACTORS
Watch this Section
for New Projects
Publish your announcement thru the "Proposals Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS
(Continued from page 114)

Bids: March 21, 1949 (888)

Lateral Sewer District No. 11

NOTICE TO BIDDERS
Village of Freeport, N. Y.

SEALED PROPOSALS will be received by the Board of Sewer Commissioners of the Village of Freeport, N. Y., at the Municipal Building, 46 North Ocean Avenue, Freeport, N. Y., at 8:00 P. M., March 21st, 1949, at which time they will be publicly opened and read and the contract awarded as soon thereafter as practicable, for the construction of Sanitary Sewers, consisting of about 11,300 linear feet of 8 inch diameter pipes, together with 5 inch house laterals to curb, manholes and appurtenant structures.

Plans and specifications may be seen and obtained at the Village Office or at the Office of Baldwin & Cornelius Co., Inc., 117 West Sunrise Highway, Freeport, N. Y. They may be taken away by prospective bidders upon deposit of $25.00, which sum will be refunded to Contractors who submit bids.

Each bid must be accompanied by a certified check on a solvent Bank or Trust Company in the sum of $10,000.00, made payable to the Village of Freeport. Each bid shall also be accompanied by a consent in writing of a Surety Company authorized to do business according to the Laws of the State of New York.

The Board of Sewer Commissioners reserves the right to reject any or all bids and to accept the bid which they deem to be most favorable to the interests of the Village.

LEO FISHEL
MICHAEL J. COFFEY
FRANK H. HOLLAND
Board of Sewer Commissioners,
Village of Freeport, N. Y.

Dated: February 17th, 1949
George F. Hasbrouck,
Village Clerk.

Bids: March 21, 1949 (889)

Lateral Sewer District No 4B

NOTICE TO BIDDERS
Village of Freeport, N. Y.

SEALED PROPOSALS will be received by the Board of Sewer Commissioners of the Village of Freeport, N. Y., at the Municipal Building, 46 North Ocean Avenue, Freeport, N. Y., at 7:30 P. M., March 21st, 1949, at which time they will be publicly opened and read and the contract awarded as soon thereafter as practicable, for the construction of Sanitary Sewers, consisting of about 3900 linear feet of 8-inch diameter pipes, together with 5-inch house laterals to curb, manholes and appurtenant structures.

Plans and specifications may be seen at the Village Office and obtained at the Office of Baldwin & Cornelius Co. Inc., 117 West Sunrise Highway, Freeport, N. Y. They may be taken away by prospective bidders upon deposit of $25.00, which sum will be refunded to Contractors who submit bids.

Each bid must be accompanied by a certified check on a solvent bank or Trust Company in the sum of $2,000, made payable to the Village of Freeport, N. Y. Each bid shall also be accompanied by a consent in writing of a Surety Company authorized to do business according to the Laws of the State of New York.

The Board of Sewer Commissioners reserves the right to reject any or all bids and to accept the bid which they deem to be most favorable to the interests of the Village.

No bidder may withdraw his bid within 45 days after the date set for the opening thereof.

LEO FISHEL
MICHAEL J. COFFEY
FRANK H. HOLLAND
Board of Sewer Commissioners,
Village of Freeport, N. Y.

Dated: February 17th, 1949
George F. Hasbrouck,
Village Clerk.

Bids: March 30, 1949 (873)

Construction of Distilling Basin and Electric Lighting System

NOTICE TO BIDDERS
Bid Date March 30, 1949

The Commonwealth of Pennsylvania will receive sealed proposals through the Water and Power Resources Board, Department of Forests and Waters, Room 404, Education Building, State Capitol, Harrisburg, Pennsylvania until 1:30 P.M. Eastern Standard Time, Wednesday, March 30, 1949, which will be publicly opened and read at that time for:

Contract No. 35. For Construction of Auburn Desilting Basin No. 1 Right, on the Schuylkill River between Auburn and Landingville, Pennsylvania.

Contract No. 35-E. For Construction of Electric Lighting System for Auburn Desilting Basin No. 1 Right, on the Schuylkill River between Auburn and Landingville, Pennsylvania.

Plans, Specifications, General Conditions and Proposal forms may be examined free of charge or complete sets not exceeding three (3) may be secured by prospective bidders by applying to Schuylkill River Project Engineers, 20 S. Fifteenth Street, Philadelphia, Pennsylvania, upon making a deposit in the amount stated below. This deposit will be refunded only upon the return of the plans and specifications in good order within ten (10) days after the opening of bids.

Each proposal must be accompanied by a proposal guarantee in the form of a certified check, bank cashier's or bank treasurer's check drawn to the order of the Commonwealth of Pennsylvania in the amount stated below.

Contract	Proposal For	Cost One Set Plans & Specs.	Proposal Guaranty
35	Auburn Desilting Basin No. 1 Right	$25.00	$125,000.00
35-E	Electric Lighting System for Auburn Desilting Basin No. 1 Right	$5.00	$100.00

A Joint Venture bid will not be considered and all proposals must be completely filled out, signed, executed and sealed in special bid envelope.

Attention is called that Article No. 10 of the Business Corporation Law approved May 5, 1933, P. L. 364 requires a foreign corporation, before doing business in this Commonwealth, to procure a Certificate of Authority to do business in Pennsylvania, from the Pennsylvania Department of State.

The Commonwealth of Pennsylvania reserves the right to reject any or all bids.

COMMONWEALTH OF
PENNSYLVANIA
Department of Forests and Waters
M. F. DRAEMEL, Secretary

Bids: March 21, 1949 (881)

Construction of Swimming Pool & Bath House

VILLAGE OF GREAT NECK ESTATES

Sealed proposals for furnishing all material and equipment and doing all work required for the construction of a swimming pool 50 feet by 100 feet and bath house at the Village of Great Neck Estates, Nassau County, New York, will be received by the Board of Trustees of the Village of Great Neck Estates at the Village Office, No. 160 Middle Neck Road, Great Neck, New York, until 8:00 P. M. on March 21, 1949, when such proposals will be publicly opened and read.

Copies of plans and specifications and other contract documents may be examined or obtained at the office of Seelye, Stevenson and Value, No. 101 Park Avenue, New York 17, New York, upon deposit of $20.00. The full amount of the deposit will be refunded upon the return in good condition of such documents within fifteen days after the opening of bids, if bid is made, or one-half the deposit refunded if returned later than fifteen days or if no bona fide bid is made. No refund will be made for return of documents after thirty days. All proposals shall be on the form furnished in the contract specifications.

Each proposal must be accompanied by a cash deposit or a certified check or bank draft drawn on a bank or trust company authorized to do business in the State of New York, in an amount equal to not less than five (5%) per cent of the proposal. Said deposit may be retained by the Village as liquidated damages in case of failure of the successful bidder to execute the contract within five (5) days after the award, or to give performance bond as required by law. The checks of the unsuccessful bidders will be returned upon the making of the award.

The Village reserves the right to waive informalities or to reject any or all bids without assigning reasons therefor.

Dated: February 17, 1949
BY ORDER OF THE BOARD OF TRUSTEES OF THE VILLAGE OF GREAT NECK ESTATES.
GLORY GARDNER
Village Clerk

OFFICIAL PROPOSALS

Bids: March 8, 1949 (901)

Furnishing Cast Iron Water Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 627-W

Sealed proposals for furnishing and delivering 5,000 ft. of 12-inch class 150; 4,500 ft. of 16-inch class 150; and 1,000 ft. of 20-inch class 150 cast iron water pipe will be received at the office of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland until 2:00 P. M. Eastern Standard Time Tuesday March 8, 1949 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt, Chairman
Lacy Shaw
Leland G. Worthington
Commissioners

Bids: March 8, 1949 (900)

Furnishing Cast Iron Water Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 626-W

Sealed proposals for furnishing and delivering 40,000 ft. of 6-inch Class 150; 30,000 ft. of 8-inch Class 150 cast iron water pipe will be received at the office of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland until 1:50 P. M. Eastern Standard Time, Tuesday, March 8, 1949 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt, Chairman
Lacy Shaw
Leland G. Worthington
Commissioners

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2584) will be received by Bureau of Reclamation, 504 Conroy Building, Casper, Wyoming, until 10 a. m., March 24, 1949, and then publicly opened for furnishing labor and materials and performing all work for the installation of overhead ground wires on the Cheyenne-Gering 115-kilovolt transmission line. The work is situated between Cheyenne, Wyoming, and Gering, Nebraska. Principal items are approximately: installing two overhead ground wires on 44 miles of 115-kv. wood-pole transmission line; and other work. Time allowed for completion will be 80 days. For particulars, address Bureau of Reclamation, 504 Conroy Building, Casper, Wyoming; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(887)

(Continued on page 116)

Official Proposals Columns of

ENGINEERING NEWS-RECORD

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Official Proposal Division

ENGINEERING NEWS-RECORD

New York 18, N. Y.

OFFICIAL PROPOSALS
(Continued from page 115)

Bids: March 24, 1949 (902)

Water Works System

NOTICE TO BIDDERS
WHITE SULPHUR SPRINGS
WATER DISTRICT
IN THE TOWN OF LIBERTY,
SULLIVAN COUNTY, NEW YORK

NOTICE IS HEREBY GIVEN that the Town Board of the Town of Liberty will meet at the office of the Town Clerk in the Sherwood Building in the Village of Liberty, N. Y., at eight o'clock p.m. on the 24th day of March, 1949, for the purpose of receiving sealed proposals for furnishing materials and equipment and performing labor in the construction of a water works system for the White Sulphur Springs Water District in the Town of Liberty, at which time and place all proposals will then be publicly opened and read aloud.

The work will be divided into five contracts as follows:

CONTRACT 1. Wells and Appurtenances.
2. Well Housing; Electrical Work in Well Houses; Conduits and Wiring for Lighting; Electric Unit Heater with Thermostatic Control; also Wiring of Well Pump Motor and the Controls Provided by Contractor for Contract 1.
3. Pipe; Pipe Fittings; Check Valves; Hydrants; Recording Pressure Gauge and Meter; Construction of Distribution System.
4. Clearing; Grubbing; Excavation and Building of Foundations and Control Manhole for the Steel Tank Reservoir.
5. Furnishing and Erecting Steel Tank Reservoir.

Form of bid; Plans; Specifications and Estimates of the Expense; Proposed Contract Forms; and Forms of Proposals; and Performance Bond may be examined and copies thereof obtained at the offices of Nial Sherwood, C. E., Chestnut Street, Liberty, New York.

A deposit of four dollars for each set of plans and specifications for each contract shall be paid on delivery of such sets.

Each proposal must be accompanied by a certified check, payable to the order of Francis Hanofee, Supervisor, in the following amounts

CONTRACT No. 1..	$2500.00
CONTRACT No. 2..	1000.00
CONTRACT No. 3..	3000.00
CONTRACT No. 4..	500.00
CONTRACT No. 5..	2000.00

or a bond with sufficient sureties in the penal sum equal to the above stated amounts, conditioned that if the proposal is accepted, the bidder will enter into a contract for the same and that he will execute such further security as may be required for the faithful performance of the contract. All deposits except those of the successful bidders will be returned.

The Town Board reserves the right to reject any or all bids.

Dated at Liberty, New York,
February 23, 1949.

TOWN BOARD OF THE
TOWN OF LIBERTY
FRANCIS HANOFEE,
Supervisor

WHITAKER WELLS,
Town Clerk. (Mar. 10)

Engineering News-Record

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Its distribution among the contractors of any one state is in proportion to the number of contractors situated in that state. The Official Proposal Columns of *Engineering News-Record* offer precisely the same efficient service to municipalities, counties, state and federal departments in every section of the United States.

OFFICIAL PROPOSALS

Bids: March 9, 1949 (870)

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY N. Y.—Pursuant to the provisions of Chapter 63 Laws of 1936, as amended, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time *WEDNESDAY, MARCH 9, 1949* by Henry A. Cohen, Director, Bureau of Contracts & Accounts, *11th* Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1 G. L. Nickerson, Dist. Engr., 353 Broadway, Albany, N. Y.				
Greene	FARC 49-25 CTRC 49-23	Palenville-Catskill, S. H. 8231 Catskill Thruway (Ulster Co. Line Brick School House Rd., Ct 46-2 Brick School House Rd. to S. H. 8231, Ct 46-3)	6.31	Asph. Conc. Opt.= 0.43 Mi. Conc. 9" Thk. = 5.88 Mi.	$85,000 Plans $10.000	$1,448,000
	RC 49-24	Saugerties-Catskill, Pt. 3, S.H. 5027 Project No. F387(2)				
		DISTRICT No. 2 L. Ketchum, Dist. Engr., 109 No. Genesee St., Utica, N. Y.				
Montgomery	FGRC 49-27	Fort Plain Village-Hancock, St. Pt. 2, S. H. 9277 Fort Plain-Canajoharie, S. H. 8384 Fort Plain Village-Hancock St., S. H. 1866 Project No. FG467(4)	0.36	Double Track Girder, 104' Span Conc. 9" Thk., 24' Wdt.	$23,000 Plans $5.00	$393,000
Oneida	FARC 49-14	Waterville-New Hartford, Pt. 2, S. H. 8298 Utica-Oneida Castle, Pt. 1, S. H. 250 New Hartford Village, S. H. 5052 Project Nos. F436(3) & F333 (17)	2.19	Asph. Conc. Opt.= 0.59 Mi. Conc. 8" Thk., 22' Wdt. = 1.59	$33,000 Plans $10.00	$561,000
		DISTRICT No. 8 J. S. Bixby, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.				
Dutchess	FARC 49-1	South, S. H. 223 Project No. F394(10)	1.49	Asph. Conc. Opt.	$25,000 Plans $5.00	$465,000
Orange	FASS 49-11	Finchville-Smith Cors., Co. Rd. 35 Project No. S265(1)	3.13	Bit. Mac. Opt. (Road Mix)	$12,000 Plans $5.00	$206,000
Ulster & Sullivan	SH 49-4 SH 49-6 SH 49-7	Woodbourne-Ellenville, Pts. 1, 2A, 2B	10.94	Alpha 350.14 I-Beam 3 Spans, Tot. 197' (Alpha) I-Beam (Alpha) Conc. Slab, Tot. 91' Grad-Gravel Surf.	$75,000 Plans $20.00	$1,346,000
		DISTRICT No. 10 J. J. Darcy, Dist. Engr., Montauk Hwy. at Little E. Neck Rd., Babylon, L. I., N. Y.				
Bronx	FACBE 49-1	Cross Bronx Expressway (Cont. 10E) Project No. U-1084(4)	0.62	Rigid Fr. 2 @ 58.35' Girder 84' Girder Fed. Overpass 2 @ 49.5' 3 Spans 214.9' Conc. 9" Thk. 2 @ 36'	$250,000 Plans $20.00	$4,281,000
Bronx	FAMDE 49-1	Major Deegan Expressway (Cont. 1A) Project No. U-1082(2)	0.72	Repaving & Drainage Demolition, Fdt., Drainage	$120 000 Plans $20.00	$2,116,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. Tallamy
SUPT. OF PUBLIC WORKS

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2582) will be received by Bureau of Reclamation, Klamath Falls, Oregon, until 2 p. m., March 25, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures for the Lost River diversion channel enlargement, Klamath Project. The work is situated about 6 miles south of Klamath Falls, Oregon. Principal items are approximately: 1,050,000 cubic yards of excavation; furnishing cement and reinforcement bars and placing 2,100 cubic yards of concrete; removing 740 cubic yards of concrete and 15,700 pounds of gates and hoists; installing 63,000 pounds of gates, hoists, and miscellaneous metalwork; furnishing and erecting 17,000 pounds of structural steel; and other work. Time allowed for completion will be 530 days. For particulars, address Bureau of Reclamation, Klamath Falls, Oregon; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(884)

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2580) will be received by Bureau of Reclamation, Old High School Building, North Warren Street, Helena, Montana, until 10 a. m., March 23, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures relocation county roads approcahes to Canyon Ferry Dam. The work is situated on both sides of the Missouri River about 16 miles northeast of Helena, Montana. Principal items are approximately: 69,290 cubic yards excavation for roadway and roadway structures; 720 cubic yards backfill; 500 cubic yards riprap; 230,000 station cubic yards overhaul; 612 linear feet furnishing and laying concrete pipe; 3,300 linear feet furnishing and constructing wire cable guard fence; and other work. Time allowed for completion will be 180 days. For particulars, address Bureau of Reclamation, Post Office Box 517, Helena, Montana; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(885)

(Continued on page 117)

U. S. Government

(Continued from the opposite page)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2578) will be received by Bureau of Reclamation, Klamath Falls, Oregon, until 2 p. m., March 23, 1949, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures for Lost River and Miller Creek channel improvements, Klamath Project. The work is situated from 32 to 40 miles southeast of Klamath Falls, Oregon. Principal items are approximately: 76,000 cu. yds. excavation; 16 cu. yds. concrete; furnishing and laying 1,000 ft. corrugated-metal pipe and 115 ft. concrete-pipe siphon; furnishing and erecting a timber bridge; and other work. Time allowed for completion will be 360 days. For particulars, address Bureau of Reclamation, Klamath Falls, Oregon; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(882)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2583) will be received by Bureau of Reclamation, Denver, Colorado, until 2 p. m., March 17, 1949, and then publicly opened for furnishing one bus structure, eight selector switch supports, fifteen disconnecting switch supports, four capacitor tie-down frames, one take-off structure, five transformer tie-down beams, one tap structure, two disconnecting-switch supports, nine capacitor tie-down frames for 230-kv switchyard at Davis Dam Project, Arizona-Nevada. Delivery is desired within 210 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(883)

U. S. Government

CORPS OF ENGINEERS, U. S. ARMY, New England Division, Army Base, Boston 10, Mass.—Inv. No. W-19-016-49-69—Sealed bids will be received at this office until 2 o'clock p.m., on the 8th day of March 1949, and then publicly opened, for construction of Boiler House, Garage, and Personnel Quarters Buildings, Veterans Administration Hospital, Manchester, N. H., in accordance with specifications and plans, copies of which are available at this office. Deposit of $25.00 per set, in form of certified check or postal money order payable to "Treasurer of the United States" required. (876)

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Construction of a Small Boat Harbor and Channel Improvement at St. Paul, Minnesota, will be received in this office until 11:00 A. M., C. S. T., 10 March 1949, and then publicly opened. Further information upon application. (872)

OFFICIAL PROPOSALS

Bids: March 15, 1949 (869)

Water Waste Survey

CITY OF BETHLEHEM

NOTICE TO BIDDERS

Sealed Proposals for "WATER WASTE SURVEY" of the Water Works System of the City of Bethlehem, Pennsylvania, addressed to the City Clerk and marked "Proposals for Water Waste Survey" will be received until 11:00 A.M. E.S.T. on the 15th day of March, 1949 in compliance with specifications on file in the office of the City Engineer and the office of the Director of Parks and Public Property.

The city reserves the right to reject any or all proposals.

Bertram L. Nagle
City Clerk

OFFICIAL PROPOSALS

Bids: April 27, 1949 (888)

Correction of ad appearing in 2/24/49.

Laying Cast Iron Pipe Distribution Mains and Appurtenant Work

CLARKSBURG WATER BOARD
CLARKSBURG, WEST VIRGINIA

Sealed proposals will be received for the item listed below by the Clarksburg Water Board at their office in Clarksburg, West Virginia until 10:00 A.M. on the 27th day of April, 1949, up to the hour of opening bids, at which time and place all bids will be publicly opened and read aloud. Bids will be received on the contract covering:

Laying Cast Iron Pipe Distribution Mains.
Approximate quantities:
14,000 lin. ft. of 12" pipe
6,000 lin. ft. of 8" pipe
600 cu. yds. of rock excavation

The successful bidder will be required to furnish a satisfactory performance bond in the amount of 100% of his contract. The contract documents, including specifications and drawings are on file at the office of the Clarksburg Water Board, Clarksburg, West Virginia and at the office of Alvord, Burdick & Howson, 1401 Civic Opera Bldg., Chicago, Illinois.

The right is reserved by the Water Board to reject any or all bids or to accept any considered advantage to the Water Board.

Certified check, cash, government bonds, bidder's bond, or bank draft payable to the Clarksburg Water Board, or a satisfactory bid bond executed by the bidder and a surety company in an amount equal to 10% of the bid, shall accompany the proposal.

No bid may be withdrawn after the scheduled closing time for the receipt of bids but bids may be withdrawn at any time prior to the scheduled time for opening bids.

SCOTLAND G. HIGHLAND
Secretary and General Manager
Clarksburg Water Board,
Clarksburg, West Virginia.
..... 1949.

EMPLOYMENT

REPLIES: Box No.: Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

SUPERINTENDENT OF Bridges and Public Buildings for the City of Milwaukee; must be graduate civil engineer with at least ten years of progressively responsible experience including bridge construction and maintenance. Position under civil service with examination consisting of experience questionnaire and submission of reports and other supporting data. Salary $7,200 advancing in three annual steps to $8,100, with liberal pension rights. Address City Service Commission, City Hall, Milwaukee, Wisconsin.

POSITIONS VACANT

WANTED—ENGINEERS, Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-1155, Engineering News-Record.

ENGINEERS (ALSO Administrative and Clerical)—Construction will start on two new power houses in the early spring and will need complete organizations. Parties interested in employment write Sanderson & Porter, Box 81, Monongahela, Pennsylvania, attention C. A. Duncan, giving complete record in first letter including marital status, education, experience, references, salary desired and any other pertinent information. P 7995, Engineering News-Record.

(Continued on the following page)

Engineering Designers

Several men for layout of Conveyor Equipment for handling heavy bulk material such as ore, coal, coke and stone for Steel Plant Installations. Should have broad experience in the design of Belt Conveyors, Hoppers and Chutes and also layout knowledge of enclosing building and gallery requirements.

Write for application form or give complete information of your past experience, including compensation earned and expected.

ARTHUR G. McKEE & CO.
2300 Chester Ave.
CLEVELAND, 1, OHIO

DESIGNERS
steel mill and structural.
In reply state age, experience and salary expected.
SWINDELL-DRESSLER CORP.
Box 1888 Pittsburgh, 30, Pa.

CONSTRUCTION SUPERINTENDENTS

Large engineering organization desires construction engineers. Must have considerable recent experience in steam-electric power plant construction, and be thoroughly qualified to direct field layout work, preparation of construction reports and specifications for subcontracts. Submit complete experience record.

P 8075—Engineering News-Record
330 W. 42 St., New York 18, N. Y.

AIR CONDITIONING ENGINEER

Thoroughly experienced in the engineering, design and selection of air conditioning equipment and installations for office buildings and industrial applications. Knowledge of modern equipment; its characteristics, economic application, also comprehensive knowledge of duct work, contractors and builders practices highly desirable. Salary commensurate with experience. Some travel involved. Give complete record education, experience, age, availability. Location New York City.

P 8074, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

SEARCHLIGHT SECTION

WANTED

Civil Engineer or Supervising Contractor

To close and contract licenses with installers, contractors and applicators of special rubberized bituminous materials in great demand for buildings, roads, sewage disposal plants, etc.

Patents have been granted; grantee has pioneered in the construction field for over 30 years.

Commissions on sales either through your own specifications or effort, or dealer sales will be paid in the territory. Commissions remunerative and continuous. State territory you can cover; also do you specify materials on certain construction work.

RUBBERIZED OIL PLASTICS CO.
(Not Inc.)
6049 W. 65th St. Chicago 2, Ill.

MASTER MECHANIC

WANTED

for concrete dam project in nearby Latin America; preferably experienced with cableway operation and maintenance; must be thoroughly experienced on heavy construction work.

Give full information in first letter, including family status, experience record, salary expected and references.

Latin American experience and working knowledge of Spanish essential.

P-7774, Engineering News-Record
330 W. 42nd Street, New York 18, N. Y.

REFINERY CONSTRUCTION SUPERINTENDENT WANTED

Minimum 5 yrs. experience in full charge of refinery construction. Salary range, $9,000 to $15,000. Location California. Furnish complete record and photo.

P 7954, Engineering News-Record
68 Post St., San Francisco 4, Calif.

WANTED—Mechanical and Structural Engineers For designing and detailing work on concrete reinforcement, structural steel and hangar door construction. Requirements are three to four years practical experience or recent graduation from technical school. Desirable working conditions and opportunities for advancement. These openings are with a nationally known steel fabricating company, located in eastern Ohio. Applicants will please submit a record of their qualifications.
P-7737, Eng. N-R, 520 N. Mich. Ave., Chicago

WANTED
Young Engineer—Under 40
with practical experience in construction and estimating cost of work for position with contracting company in central and eastern states. Write full information concerning qualifications, experience, previous salaries, and yearly compensation expected. Include photograph if available.
P-8186, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

SALARIED POSITIONS $3,500—$35,000
If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.
R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS VACANT

(Continued from preceding page)

STRUCTURAL DRAFTSMAN: Experienced on steel and reinforced concrete bridges. Should be good letterer and able to make up contract plans from designers studies. Mid-Atlantic location; P 8042, Engineering News-Record.

STRUCTURAL DETAILERS—Checkers. Paid holidays. Vacation. Ralph Rinker, 572 Bellevue Ave., Trenton 8, New Jersey.

WANTED ESTIMATOR, experienced, by general contractor. Permanent position. State age, education and starting salary. Reply Box 2830, Wheeling, West Virginia.

SUPERINTENDENTS AND high-class Foreman for concrete bridge work, pile driving and earthwork, by a well established company in the northeastern area. Steady work and advancement to the right men. P 8117, Engineering News-Record.

WANTED—GENERAL Construction Superintendent on a large housing project. Must be good organizer and capable of assuming full responsibility of the actual construction as well as the coordination of all subcontracted trades. P 8102, Engineering News-Record.

WELL ESTABLISHED retail firm has position open for structural engineer between the ages of 30 and 40 who is familiar with concrete structures. College degree in engineering and at least five years field experience or experience with structural engineering firm required. Applicant must be capable of supervising construction and experienced in designing and detailing of concrete. Must be free to travel, headquarters in Atlanta, Southeastern resident preferred but not required. Give full details of educational and business history in letter of application. P 8130, Engineering News-Record.

WANTED, ENGINEER—Superintendent for General Contractor operating in Northern New Jersey. Must be able to estimate. Please state age, experience, and salary. P 8146, Engineering News-Record.

WANTED: SUPERINTENDENT for Heating, Piping and Air Conditioning Contractor located in Central Pennsylvania. Experience necessary. Salary plus commission. Send references and state age and experience in first letter. P 8174, Engineering News-Record.

WANTED, SEVERAL engineering graduates, under 35, by large industrial fire prevention organization maintained by leading insurance group. Permanent position. Periodic inspections and special consulting service for leading industrial plants. Thorough training. P 8063, Engineering News-Record.

WANTED ENGINEER capable of estimating and supervising water and sewer contracting. State qualifications, experience, and salary expected. P 8183, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

ALASKA SALES Representative wanted by nationally known manufacturer of portable gasoline-engine-driven pumps, generators, chain saws, electric paving breakers, etc., selling to contractors, railroads, utilities, mining and pulpwood industries on commission basis. Exclusive territory. State qualifications, references, experience. Company official will come to Anchorage in April for interviews with qualified applicants. Write Homelite Corporation, Port Chester, New York.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change in connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

SUPERINTENDENT CONSTRUCTION 20 yrs. experience, industrial or high class finished projects. Engineer. Anywhere. Salary $150. PW 8033, Engineering News-Record.

CONSTRUCTION ENGINEER, 25 years experience on all types of government, commercial, and industrial construction. Formerly Construction Supervision for Navy Department, Bureau of Yards and Docks. Licensed, Professional Engineer and Land Surveyor with several years experience on all types of surveys. PW 8178, Engineering News-Record.

Former top official associated with the design, construction, operation and placing in standby of the "Big Inch" and "Little Big Inch" Pipelines seeks position as Project Manager with firm of engineers or contractors. Graduate engineer with 22 years experience in the administration of major construction projects. Excellent record with top flight companies—Available March 1, 1949.

PW-8009, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

POSITION WANTED:
By Water Well and Diamond Drill Foreman
with over 20 years experience in water supply development, placer gold testing and quarry work, using cable and rotary equipment. Desires work in foreign country. Age—forty-three. Best references. Speaks several languages. Have own modern diamond drill with experienced crew, available for foundation testing, water tables, minerals, etc.
ADDRESS: DRILLER,
324 SPRUCE AVENUE, ALTOONA, PA.

POSITIONS WANTED

CIVIL ENGINEER—Graduate, age 28, 4 years experience, 1 year in field, 3 years in office. Experienced in design, drafting, estimating, quantity take-off; reinforced concrete; sanitary-structural field. Desires responsible position in field or office. Prefer New York area, limited travel. PW 8069, Engineering News-Record.

CIVIL ENGINEER—Young, Aggressive. One year experience with water front construction company New York City. Now working for American Oil Co. in South America. Desires job abroad or in USA. Perfect knowledge Spanish. PW 8109, Engineering News-Record.

OFFICE MANAGER—for foreign or domestic construction. Capable, aggressive young man with background of continuous construction experience dating back to 1937 as office manager, field accountant, cost engineer and purchasing agent for many types of contracts including cost-plus, lump sum and unit cost. General building construction, marine installations and earth moving projects—domestic and foreign. Desire position with construction organization having considerable volume of work. Ex-naval officer with best business and character references. Reply PW 8-84, Engineering News-Record.

CONSTRUCTION ENGINEER, Iowa U. Grad. Married. 9 years experience field and office. Dam, tunnels, earthwork, pipeline, railroad, buildings, desire responsible position preferably as office engineer. Box 46, Pickstown, S. D.

CIVIL ENGINEER, 20 years experience in bridges, highways, sewers, airports; design, construction and administration. Desires permanent position. Mid-West preferred. PW 8132, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT: twenty-five years experience all types of construction, liason and inspection. Master mechanic on mechanical installation. Cost minded. Fine past personnel relations record and will produce results. Experienced, purchasing, costs, specifications, sub contracts, etc. Available March 1st. PW 8150, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT (15) years experience in commercial. Wide experience in housing and apartment projects. Have good organization. Available Feb. 15, 1949. PW 8144, Engineering News-Record.

DESIGNER, CHECKER, Draftsman, Detailer; experienced on varied structural steel and reinforced concrete structures, college graduate, licensed, age 59. Location immaterial. PW 8142, Engineering News-Record.

ASPHALT TOP Foreman age 38, 11 years experience all types asphalt, airports, levee, streets, roads. Qualified Roller, Grader, Barber-Greene operator. Available at once. J. C. Park, 400 Silver St., Lewisburg, Tenn., Phone 634 J.

STRUCTURAL STEEL and miscellaneous iron. Thoroughly experienced in the business in all phases selling to shop. Have been for many years Contracting Engineer and Executive of large steel firm. PW 8162, Engineering News-Record.

INSTRUMENTMAN, 10 years experience, wishes 2nd place on survey, engineering, construction party. $1.25 hour. 39, will travel. Technical education. PW 8176, Engineering News-Record.

(Continued on opposite page)

A COURSE OF INSTRUCTION BY MAIL IN

STRUCTURAL ENGINEERING

Thirty-ninth Year

(In the following list, Courses A, B, and C are abbreviated from our complete Structural Engineering course).

A—Public Works Structures.
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Our courses have helped thousands of men to better positions.
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Napoleon once said
"An Army Marches on Its Stomach"

We Have Fed Millions

KANE INDUSTRIAL SERVICE

Industrial Feeding.
Labor Camps.
Labor Camp Equipment.
Free Employment Agencies.
30 Years' Experience in the Housing and Feeding of Men for Satisfied Clients.
Abundant Labor Supply available for Large Projects Anywhere.

VALENTINE B. KANE & ASSOCIATES
1410 State St. New Haven 11, Conn.

POSITIONS WANTED

(Continued from the opposite page)

EXECUTIVE ACCOUNTANT—C.P.A. (NY)) offers broad experience in accounting matters, taxes and office management. Age 46. Excellent references. PW8119, Engineering News-Record.

EXECUTIVE CONSTRUCTION Engineer with extensive foreign experience. Foreign assignment only. $15,000 net. P.O. Box 241, College Park, Maryland.

SUPT. WATER Works—Extensive experience in operation and maintenance of water plants. Especially successful in improving coagulation and filter efficiency, and removing bottlenecks in plants and distribution systems. Education M.S. in chemistry. Interested only in position where waterworks properties are to be properly maintained. PW 8032, Engineering News-Record.

CONTACT MAN. Internationally known Catholic layman with excellent Church connections desires to represent reputable and competent general contractor interested in Church school, hospital, etc. work. Thorough knowledge all phases construction business. PW 8191, Engineering News-Record.

BUILDING: PROJECT or Construction Manager also General Superintendent; 30 years experience full charge of large projects, years actual experience cost clerk; estimator; purchasing; closing; manager; general and job superintendent; all types of structures and allied construction all kinds of contracts. PW 8198, Engineering News-Record.

BUSINESS OPPORTUNITIES

Wanted: Purchaser of part interest in reputable construction corporation. State qualification, financial responsibility. Answers confidential. Address BO 8127, Engineering News-Record.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 454, 815-15th Street, N.W., Washington 5, D. C.

LEARN TO ESTIMATE

Today, more than ever before, you must know how to analyze building costs. If you want to become a successful builder, learn how to prepare a correct estimate in a hurry. Get in on the profitable work now available wherever you turn. Your success is assured if your estimates are right; otherwise you are licked before you start.

The Tamblyn System of Estimating will make a real estimator out of you in a few weeks of your spare time. We are so sure that you will want to learn it, that we will send you our complete home study course for ten days examination absolutely free. If you don't think it is the finest thing you ever saw, just return it and it won't cost you a cent. If you like it and want it, send us $8.75 when 10 days are up and $7.50 per month until $38.75 is paid.

This estimating system is based on forty years of actual construction experience. It has been sold all over the world for more than twenty years. Thousands of estimators and contractors swear by it. Our offer isn't hot air and big talk. We don't give you a diploma or a lapel button, but we do teach you down to earth estimating which will bring you profitable business.

Just send your name and address today, and we will mail you the complete course at once for your approval.

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Denver, Colo.

FOR SALE

Heavy Construction Co.

Land Clearing, Road Building, Excavating
$30,000 in signed contracts
Inventory value only

Addressee 2265 S. W. 28th St.
Miami, Fla.

FOR SALE

Contracting business, road building, land clearing, excavating, etc.
Completely equipped with good machinery, now operating.

Write P. O. Box 713 Little River Sta.
Miami, Fla.

WANTED

Contractors desiring to do resealing work of expansion, contraction and other types of cracks in paving and monolithic construction with rubberized bituminous material ZERO-LASTIC, a compound which will maintain seal at zero degrees temperature—a lucrative contracting business. For particulars, write to:

RUBBERIZED OIL PLASTICS
(Not Inc.)
6049 65st St. Chicago 38, Ill.

WANTED

Large engineering firm wishes to acquire several complete plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.

Box 1206
1474 Broadway, New York 18, N. Y.

FOR SALE

CONCRETE PLANT

2—3½ cu. yd. Jaeger-Lembo Mixers, one mounted on 1928 Mack Truck, other on 1943 GMC - 10 wheel truck.
1—x-66 cu yd. 3-compartment Butler Type Bin with weighing batcher.
1—Gasoline Driven Conveyor Elevator.

HENRY QUIST, INC.
31-18 38th AVENUE
LONG ISLAND CITY 1, N. Y.
STillwell 6-1572

FOR SALE

6 Transit Mix Trucks, Macks, Smith—2 yard Mixers

FRAZIER-DAVIS CONSTRUCTION CO.
1319 Macklind Ave. St. Louis, Missouri
or
1 East 43rd Street New York, N. Y.

USED MACHINERY FOR SALE

Lima 1201 Dragline 1947 Model w/ Cummins Diesel Engine, Kohler light plant, 120 ft. boom, 3½ yd. bucket, with extras—moved 300,000 yds. since new—cost $75,000.00—Sell for $55,000.00.

FS-8159, Engineering News Record
520 N. Michigan Avenue, Chicago 11, Ill.

One—Barber-Greene Travel Plant, Model 848, including Heavy Duty Paving Loader and Normal Duty Mixing Unit. Like New, excellent condition.
One—Barber-Greene 44C Ditcher for 22" cutting width.
Condition good.

AND

J. P. BURNS
Knickerbocker Road Dumont, N. J.

NEARLY NEW

900 BARREL JOHNSON TWIN SILO BULK CEMENT PLANT

PRICE $5500

JUTTON-KELLY CO.
13240 Alber Ave. Dearborn, Michigan

FOR SALE

MODEL 25 NORTHWEST COMBINATION BACKHOE, CRANE, AND SHOVEL FRONT, 1942, Serial 7024

AND

MODEL 25 BACKHOE ATTACHMENT ONLY
Subject to Prior Sale

CAMILLO PROFENNO COMPANY
25 Free St. Tel 2-1979 Portland, Me.

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Our craftsmen have a completely equipped department fully able to accommodate the repair of all makes of transits, levels and measuring tape. Work includes thorough overhaul, cleaning, oiling and adjustment.

Precision work guaranteed.

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TRANSITS & LEVELS

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Patterns to suit every surveying need.

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RE-BUILT REPAIR RENT REAL EXPERTS
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SPECIALIZED REBUILDING
of surveying and engineering instruments
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A complete line of Engineering Instruments and Equipment for field or office. Write for catalog N.R.-93

WARREN-KNIGHT CO.
Manufacturers of Sterling Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

SURVEYING INSTRUMENTS REPAIRED

Send your transits and levels for complete overhauling and reconditioning by experienced factory-trained mechanics. Examination and estimates without cost. Your instrument should be sent express prepaid for a prompt repair estimate.

J. H. WEIL & CO.
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WE REPAIR—all makes
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EVERY WEEK

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ENGINEERING NEWS-RECORD

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WANT TO BUY *NEW SURPLUS*
VALVES & PIPE FITTINGS
EAST COAST VALVE & FITTING CO., INC.
725 FIFTH AVE. BROOKLYN 32, N. Y.

WANTED TO BUY

3/8 and 1/2 yard clam shell bucket, A-1 condition; price right. One (1) 45" lifting magnet, 230 volt. Phone FEderal 3383, or write

COLUMBIA METAL & IRON SCRAP CO. INC.
Corliss Station. Pittsburgh 4, Pennsylvania

Compressors Wanted
STATIONARY - PORTABLE
LARGE OR SMALL
L. W. BAUER
22 Barnett Street Bloomfield, N. J.

WANTED
Backhoe Attachment

Wanted to buy used backhoe attachment complete for 15 B Bucyrus Erie

S. P. PUFFER JR.
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Anything you want
that other readers of this paper can supply

OR—
Something you don't want
that other readers can use, advertise it in the
SEARCHLIGHT SECTION

WANTED

2¼ yd. Clam Shell Bucket
⅜ yd. Backhoe for Bay City Model 30
35 ft. Lattice Boom for Northwest Model 25

"STONE THE CRANE MAN"
415 Brainard Ave. *Temple 1-2515* Detroit 1, Mich.

WANTED

Crane Boom to fit Lorain 820, 50' plus 20' section. Boom Harness and Pennant Lines to fit Set Fairleads. All above accessories should be new or near new.

LYCOMING CONSTRUCTION CO., INC.
127 Susquehanna St. Williamsport, Penna.

L.B.SMITH INC. OFFERS

AIR COMPRESSORS

Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.
Gardner-Denver, 105 foot, with air receiver, hose reel, driven by power take-off and mounted 1941 Ford.
Gardner-Denver air-cooled 105 foot with receiver, V-Belt driven from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.
Gardner-Denver two-stage 160 ft., skid mounted.
Worthington 210 cubic foot, two-stage air-cooled, on steel wheels with Hercules diesel.
Chicago Pneumatic 210 cubic foot, two-stage, air-cooled, Caterpillar diesel on four rubber tired wheels.
Gardner-Denver 315 cu. ft. two-stage, skid mounted, Murphy four-cylinder diesel.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

QUARRY EQUIPMENT & BINS

18 x 36 Farrell deep jaw crusher, with McLanahan 3' x 7' roll type feeder.
10 x 20 Champion No. 4½ primary jaw crusher
10 x 7 Allis Chalmers Blake type jaw crusher.
Williams 20-S pulverizer.
100 ton 3 compartment storage or aggregate bin with or without batcher and scales.
60 ton 2 compartment storage bin with clam shell gates.

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3 to 125 HP in stock
Open and Totally Enclosed

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1½-ton Ford & Chevrolet.
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Van Trailers with 17'x7'8"x6' bodies. Five ton capacity.
2,000 gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

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New JXD Hercules Gasoline.
Buda, Hercules, Hill diesels, rebuilt.
New Murphy 4 and 6 cylinder diesels.
GM 6 and 12 cylinder diesels, practically new.
New Cummins 6 cylinder diesels for Euclids.

DIESEL GENERATORS

7½ KW to 125 KW. Alternating and direct current.

SHOVEL

Osgood 1¾-yd diesel powered shovel with 23' boom, 17' dipper stick, 1¾-yd dipper D13000 diesel engine. Excellent condition.

SHOVEL ATTACHMENTS

Lorain 30A chain crowd, LBS#5142, 16' boom 13'4" stick ½-yd dipper.
Lorain 40 cable crowd, LBS#3989, 18' boom 14'4" stick ¾-yd dipper.
Lorain 40 Hi-Lift, 25' boom 19'8" stick LBS#5877, new ¾-yd dipper LBS#7750.
Lorain 40 chain crowd, LBS#4395, 16' boom 14' stick ¾-yd dipper LBS#7433.
P&H 203A, LBS#2527, 19'6" boom 13' stick ⅜-yd dipper.
Bucyrus-Erie 30B tunnel front 9' stick 1½-yd dipper LBS#3392.
Koehring 502 with necessary parts to convert from crane to shovel, 21' boom 16' stick 1¼-yd dipper.

DRAGLINE FAIRLEADS

New Osgood ½-yd Model 200.

BACKHOE BUCKETS

¾-yd Lorain, 40, LBS#6105, 44" cutting width, teeth, sheave.
27" outside width drop bottom type LBS #1033, good condition.
26" outside width solid bottom type LBS #4377, good condition.

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.

SHOVEL DIPPERS

Lorain 27, ⅜-yd. LBS#4658.
Lorain 27, ⅜-yd. LBS#4912.
Bucyrus-Erie 20B, ¾-yd. LBS#3801.
Lorain 41, ¾-yd, LBS#7433, new condition.
New Lima 1-yd, Amsco, LBS#2295.
Bucyrus-Erie 1¼-yd gas air, LBS#3782, fair.
Lorain 75 manganese 1¼-yd, LBS#7233, teeth & bail.
Lorain 75B, 1¼-yd. extended lip, 1¾-yd. LBS#2260.
Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS#5361.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#6153.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#5763.

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Pavers & Mixers

Ransome 34E dual drum, new October, 1943, with 36'9" boom, 1000 gallon auxiliary water tank, Cummins engine, rebuilt.
Jaeger Model 14DL, non-tilt mixer, rebuilt.

Concrete Finishers

Jaeger type "L" double screed, 10½'-12½' rebuilt.
Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½'-12½', rebuilt.
2 Koehring 10'-12', rebuilt.
Koehring 10'-16' finisher, rebuilt.

Concrete Spreaders

Blaw-Knox type SA 10'-15' spreader new 1943. New condition.

Concrete Road Forms

830'—Truscon 7"x8" forms, with stakes.
1380'—Heltzel 7"x8" forms, with stakes.
1300'—Blaw-Knox 8"x8" forms, with stakes.
445'—Heltzel 9"x8" forms, with stakes.
1430'—Heltzel 10"x8" forms, with stakes.
1010'—Blaw-Knox 10"x8" forms, with stakes.

Fine Grade Machines

Flynn surgrader 10'-12', rebuilt.
R.B. Fine Grader for 21' width, rebuilt.

Form Graders—2 of each

Cleveland formgrader, new condition.
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Buc-Erie 22B Dragline, Diesel.
P&H 1225 2½ yd. Electric Shovel.
Northwest 80 2½ yd. Shovel-Dragline.
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P&H 855B 2 yd. Diesel Shovel.
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Marion 37 Electric Shovel 1⅜ yds.
Marion 90 steam crane-pile driver.
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Northwest 6 Diesel Drag. 1⅜ yds.
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Rooter 5½ ton LaPlant-Choate.
Blaw-Knox Concrete Spreader, 20'x24'.
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Cedar Rapids "Speedline".
Cedar Rapids Portable 20 Ton per hr.
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Allis-Chalmers HD14C, equipped with D.D.P.C.U. and pusher block. New July, 1947.
Allis-Chalmers HD-19H with angledozer blade. New July 1948.
Int. TD18 with Heil angledozer Trail Builder with D.D.P.C.U. New Nov. 1947.

GRADERS:

Warco Motor Grader, new September 1947.
Adams Motor Grader, new September 1947.
Austin-Weston 99H New Nov. 1948. Int.-UD14 Diesel Engine.

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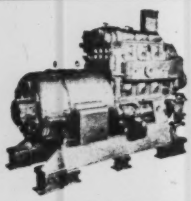

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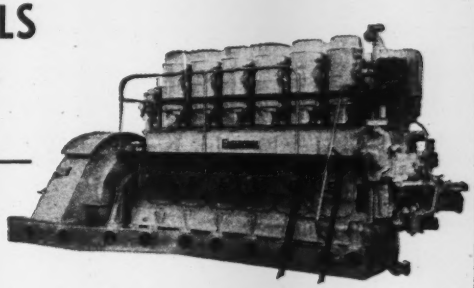

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Made to U. S. Navy specifications, of special treated cloth, has reinforced double stitched seams, adj. cuffs, fly front, deep flap pockets and corduroy collar. Keeps your men on the job. Medium & large sizes.

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Made to Navy specifications. Can be worn over outer clothing. Has adj. suspenders. Medium & large sizes.

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Has fly front, corduroy collar. Made to Navy specifications. Medium & large sizes.

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BOTH FOR **$4.25** 12-2 piece suits $48.00
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1⅛" x 6" Shank, fits std. hammers. Each tool brand new and guaranteed. The government buys only the best. Replace your old tools at a fraction of their regular price. These tools are army surplus.

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11½" razor sharp blade—better than light axe. Carries flat.

$12.00 VALUE **$1.50** COMP. with SCABBARD
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1—Austin Western, Model 99M Auto Patrol Grader, equipped with International Diesel engine, 4—14x20 tires and scarifier.
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The above machines have been used only on steel erection or hook block work and are as good as new.

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Q	H.P.	Make	Type	Volts	RPM
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2	50	Imp.	W-55	220	825
1	52	G.E.	ITC	220	570
1	52	G.E.	IQC	220	960
1	60	G.E.	MTC-5546	220	570

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1	40	G.E.	COM-1828	230	1350/2200
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30"	6	1/8" — 1/16"
30"	5	1/8" — 1/16"
26"	5	1/8" — 1/32"
24"	5	1/8" — 1/32"
24"	4	1/8" — 1/32"
20"	5	1/8" — 1/32"
20"	4	1/8" — 1/32"
18"	4	1/8" — 1/32"
16"	4	1/8" — 1/32"
14"	4	1/16" — 1/32"
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	12"	6	8"	5	4"	4
	12"	5	6"	6	3"	4

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APPROVED SPECIFICATION HOSE EACH LENGTH WITH COUPLINGS ATTACHED

I.D. Size	Length	Per Length
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	25 "	13.00
1½"	50 "	20.00
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Specify Thread On Couplings

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I.D. Size	Length	per Length	Universal Couplings
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1¼"	25 "	7.50
	35 "	$10.50
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	50 "	15.00
1½"	25 "	10.00
	35 "	14.00
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Each Length with Couplings Attached

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11x10 Sullivan Belted Compressor, 50 H.P. Motor.
50 & 20 H.P. D.D. Novo Gasoline Hoists.
50 H.P. D.D. Electric Hoist.
Boiler for Crane; 150 Lb. Steam Pressure.
2 & 3 Drum Steel Hoists.

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Distributors for Pettibone Mulliken Corp.

Clamshell - Dragline - Dipper and Pull Shovel Buckets

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FOLLOWING—Rebuilt and Guaranteed
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Construction Equipment

1—Lorain 80—Combination Shovel and Crane, Serial No. 9732. Rebuilt in 1948. Complete with shovel front and 60-foot crane boom, Williams dragline bucket and Fairleads. Kohler light plant.

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1—HD-14 Allis-Chalmers Tractor. Purchased new in 1946. Complete with trail-builder blade and double drum power control unit. Good condition.

Supply of spare parts for this equipment also available.

Equipment located at Mount Morris Dam Site, Mount Morris, N. Y.

For inspection and details contact

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Mount Morris, N. Y. *Phone*—**Mount Morris 298**

USED CHEMICAL FEEDERS AND FLOCCULATING EQUIPMENT FOR SALE

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1—Wallace & Tiernan Ferric Chloride Feeder having a range from 12½ to 200 gallons per 24 hours. The motor in the feeder is 110 A.C.

1—Wallace & Tiernan Ferric Chloride Feeder having a range of 125 to 2000 gallons per 24 hours. The motor in the feeder is 110 A.C.

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The above equipment was installed in 1937 and has been operated in service about two weeks only. The equipment has been well maintained and is in good condition.

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Mr. Robert Burrell
Superintendent
Sewage Treatment Plant
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FOR SALE

Six. cu. ft.

"YUBA"

gold placer bucket line pontoon dredge, capable of digging 35 ft. below pond water level.

Dredge is equipped with:

3—Step down transformers from outside power source, 60 cycle, 3 phase, 440 volt power required.

8—Two cell Pan American placer type jigs. Size of each cell 42 in. x 42 in. Complete with accessories.

1—Scavenger jig.

2—Rear steel spuds, 50 ft. long.
110 Ft. Stacker.
Heating boiler and insulated house.

The dredge is in first class operating condition, in the pond near Helena, Montana, where work was completed, and may be inspected.

Will sell complete unit f.o.b. railroad cars, Clancy, Montana.

Additional information will be furnished upon request.

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1470 Northwestern Bank Building
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ASTM A7-46

Immediate Delivery From Stock

310,000#	6"	WF-Beams	20#	40'
235,000#	8"	WF-Beams	31#	40'
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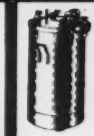

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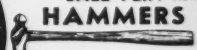

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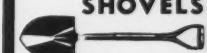

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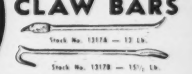

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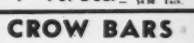

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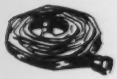

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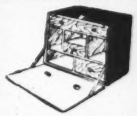

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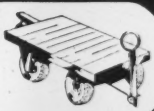

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25 pcs.	21" WF Beams	112	40'
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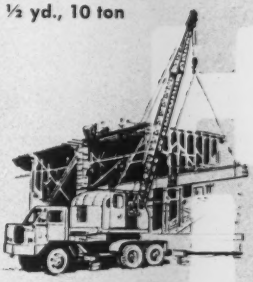

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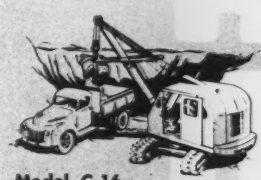

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Tough Going at Yumagila Bend

This photograph shows part of the 7½ mile Yumagila Bend road under construction in the Rocky Mountains of Arizona. The project involved the removal of 100,000 yards of rock material.

At the bottom of the picture, dwarfed by the immensity of the surrounding terrain, can be seen a "Caterpillar" Diesel D8 Tractor equipped with "Caterpillar" Cable Control and "Caterpillar" No. 8A Bulldozer.

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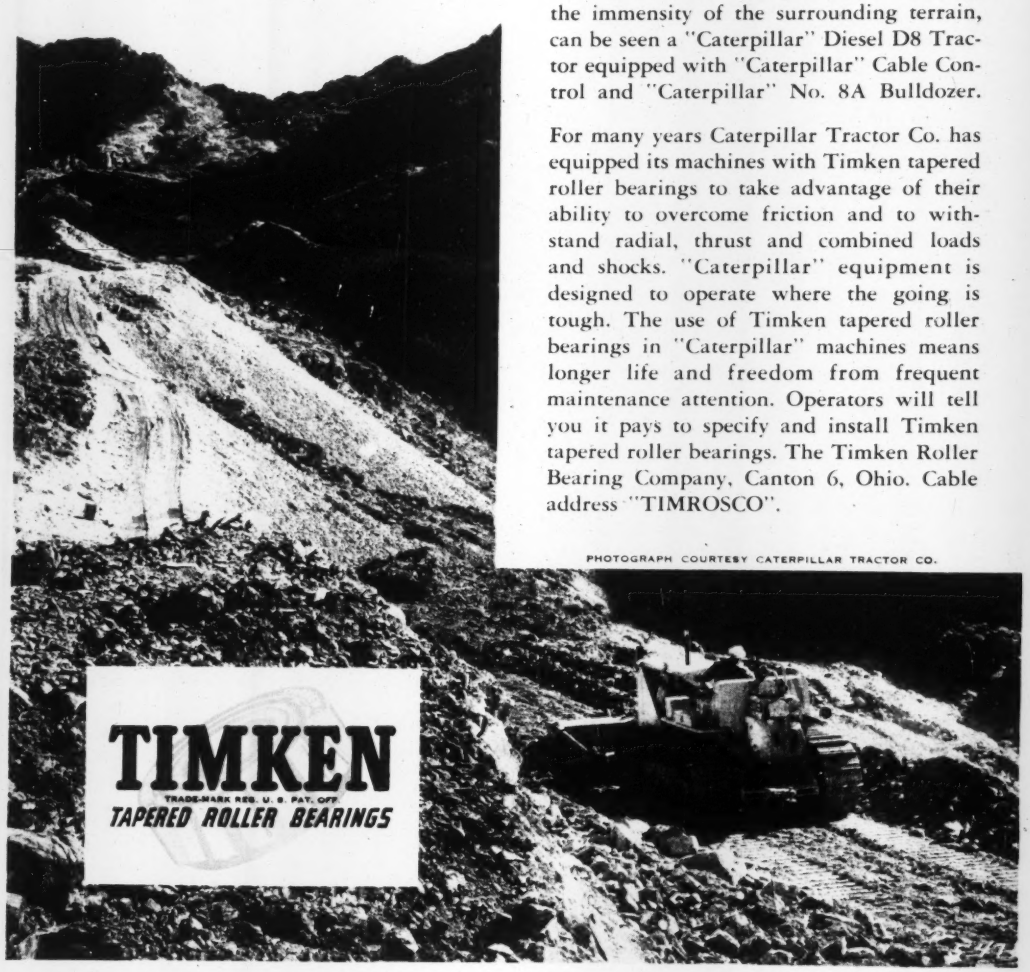

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